# Raphael

# Service Manual



HTC Proprietary

Confidential Treatment Requested

Rev. A10

HTC Corp.

*Engineering Mobility*

**REVISION CONTROL TABLE**

| REV | DATE | CONTENTS | DEPT | REVISED | STAGE |
| --- | --- | --- | --- | --- | --- |
| AX01 | 2008/7/2 | Fist Draft | PSE | Budiman Cheng | DVT |
| A01 | 2008/7/23 | 1. Change picture of water sensitive label location on generic labeling plan<br>2. Update feature sheet (GSM/EDGE to quad band frequency, battery life and add extended battery with battery cover in the accessory list as an optional item)<br>3. Update sleep and idle current test on chapter 5.1<br>4. Add RF antenna spec on chapter 10<br>5. Add spare part list on chapter 9.1 | PSE | Budiman_Cheng | PVT |
| A02 | 2008/8/11 | 1. Update assembling procedure and pictures on chapter 2.3<br>2. Update cosmetic inspection criteria | PSE | Budiman_Cheng | PVT |
| A03 | 2008/9/1 | Update feature sheet: add eMobile SKU with 1700MHz UMTS band | PSE | Budiman_Cheng | PVT |
| A04 | 2008/10/15 | 1. Add picture and “Return to HTC” column on chapter 9.1<br>2. Update speaker installation notice on chapter 2.3<br>3. Update assembling procedure on page 27 | PSE | Budiman_Cheng | MV |
| A05 | 2008/10/20 | 1. Update repair code on chapter 9.1<br>2. Change hot key to enter diagnostic mode on chapter 4.1 | PSE | Budiman_Cheng | MV |
| A06 | 2008/10/31 | Update board level 2.5 repair on chapter 9.2 | PSE | Budiman_Cheng | MV |
| A07 | 2008/11/10 | Add sleep and idle current test condition on chapter 5.1 | PSE | Budiman_Cheng | MV |
| A08 | 2008/11/20 | Add some part numbers on chapter 2.3 (Assembling procedure) | PSE | Budiman_Cheng | MV |
| A09 | 2008/11/26 | Add FRU M/B additional parts location on chapter 9.3 | PSE | Budiman_Cheng | MV |
| A10 | 2008/12/01 | 1. Remove 76H02985-00M from chapter 9.1 SPL for repair (ECR#28037)<br>2. Change assembling procedure on chapter 2.3 (ECR#28037)<br>3. Add 76H03122-00M into chapter 9.3 (ECR#28037) | PSE | Budiman_Cheng | MV |

# 1. Introduction

- This manual provides the technical information to support the service activities of this product.
- This document contains highly confidential information, so any or all of this document should not be revealed to any third party.
  - Chapter 1: Introduction-This Chapter is about Products features and basic Product function. After reading this chapter, you will know what feature the product has and basic hardware operation. Also you will know how to perform soft-rest and hard-rest in this chapter.
  - Chapter 2: Device Disassembling and Assembling Procedure- After reading this chapter, you will learn how to disassemble and assemble the product. Also, you will know what tools to use and the torque. Please follow the instruction to disassemble the unit to prevent from damaging the unit.
  - Chapter 3: ROM Re-flash Procedure- After reading this chapter, you will learn how to perform the ROM image re-flesh by using RUU and SD-Card. Also you can find the steps of enter the boot loader mode.
  - Chapter 4: DIAGNOSTIC PROGRAM- After reading this chapter, you will learn
    - How to use the diagnostic program to perform unit function test
    - How to test some functions in Windows Mobile mode (ex. WLAN, Bluetooth, and USB etc…)
  - Chapter 5: Power measurement test- After reading this chapter, you will learn how to use MB leakage test procedure and battery run-down test (Battery Capacity Measurement).
  - Chapter 6: Cosmetic Inspection Criteria- After reading this chapter you will learn the appearance quality inspection criteria, ex. Display, bezel, and housing etc…
  - Chapter 7: Generic Troubleshooting- After reading this chapter, you will learn how to do generic trouble-shooting.
  - Chapter 8: Generic Labeling Plan- In this chapter, you will find generic labels for reference, ex. Regulation label, and battery label etc…
  - Chapter 9: Generic Spare Part List and Photos- In this chapter, you will find Spar parts reference list and photos for repairing, including unit and Board level.
  - Chapter 10: RF Antenna Specification- Reference Spec for RF test.

## 1.1 Product Features

### Features

**Target**

- Schedule: August 8, 2008

**Platform**

- PDA form factor integrated dual modes HSPA/ UMTS and quad-band EDGE/GPRS/GSM, GPS/A-GPS, G-sensor, Bluetooth, WiFi, 3.2 mega-pixel camera with flash light, and one stop sliding QWERTY keyboard
- Windows Mobile 6.1 Professional

**Dimension**

- 102 mm(L) x 51 mm(W) x 18.05 mm(T)

**Processor/Chipset**

- Qualcomm MSM 7201a, 528Mhz

**Memory**

- ROM: 512MB
- RAM: 288 MB (including 32MB memory in the baseband)

**LCD Module**

- 2.8" VGA 480x640 dots resolution
- 262K-color TFT LCD (OS support 65K colors only)
- One stop slide design
- Sensitive Touch Screen

**HSPA/UMTS/EDGE/GPRS/GSM Function**

- Internal antenna (single antenna)
- AT&T, Telstra and DoCoMo SKU
  - HSPA/UMTS tri-band 850/1900/2100 MHz and GSM/GPRS/Edge quad-band 850/900/1800/1900 MHz
- EU and SBM SKU
  - HSPA/UMTS dual bands 900/2100 MHz and GSM/GPRS/Edge quad-band 850/900/1800/ 1900 MHz
- eMobile SKU
  - HSPA/UMTS 1700 MHz and GSM/GPRS/Edge quad-band 850/900/1800/1900 MHz
- HSPA/UMTS
  - 850: 824-849MHz, 869-894MHz
  - 900: 880-915MHz, 925-960MHz
  - 1700: 1844.9-1879.9MHz, 1749.9-1784.9MHz
  - 1900:1850-1910MHz, 1930-1990MHz
  - 2100: 2100:1920-1980MHz, 2110-2170MHz
- GSM/GPRS/EDGE
  - 850: 829~849, 869-894MHz
  - 900: 880-915, 925-960MHz
  - 1800: 1710-1785, 1805-1880MHz
  - 1900: 1850-1910, 1930-1990MHz
- HSDPA / UMTS
  - 3GPP Release 5 compliant
  - 3.6/ 7.2Mbps peak rate [operator dependent]
- HSUPA [Option, operator dependent]
  - 3GPP Release 6 compliant Category 5, 2Mbps
  - 2Mbps peak rate
- Global roaming
- Auto band switching
- Handover and cell selection between GSM/EDGE and WCDMA
- DTM
- SAIC(Circuit-Switch only)
- Equalizer
- Audio codec: AMR NB, EFR, FR, HR
- SMS (MO, MT), concatenated SMS (640 characters)
- Supplement services:
  - Call holding/waiting/forwarding
  - Call barring
  - CLI (Calling Line Identity)
  - Display own number
  - Network selection
  - Cell broadcast
  - Multi-party conference call
  - Spool icon
  - Phase 2+ unstructured supplementary service data
  - Network Lock
  - CPHS (partial support)
- EGPRS Functionality
  - EGPRS class B
  - Multi-slot class 12 (10, operator dependent)
  - PBCCH
  - Link Adaptation and Incremental Redundancy
- USIM/SIM
  - 1.8/3V of UICC
  - USIM Application at least according to 3GPP TS 31.102
  - SIM Application Tool Kit release 96 complete, 98 class 3, and 99 partial
  - EAP-SIM
  - Over the Air (OTA) programming
  - FDN
  - ADN
  - Security Pin 1 & 2 control
- MCC-MNC-UC-ID, as stated in 3GPP TS 25.401 R99, Section 6, for both RIL and radio

**Standalone GPS / A-GPS**

**GPS**

- Internal GPS antenna
- XTRA support
- Sensitivity -145dBm for cold start and -155dBm for tracking
- Support both standalone & assisted modes
- Support NMEA 0183 version 3.0 or above
- Dynamically allocated parallel channel GPS receiver
- Acquisition time
  - Hot start: 8 seconds, average TTFF(open sky & static condition)
  - Warm start: 60 seconds, average TTFF(open sky & static condition)
  - Cold start: 75 seconds, average TTFF (open sky & static condition)

- Update rate: once/1sec (default)
- GPS Accuracy
  - Position: < 15 meters, 95% successful rate
  - Velocity: 0.05 meter/sec steady state

**A-GPS**
- Support UE-Based & UE-Assisted A-GPS
- OMA SUPL v1.0 compliance (v2.0 if available)
  - SUPL-RRLP
  - WAP push over SUPL
- Standard 3GPP A-GPS compliance
  - 3GPP TS 44.031 (RRLP 5.12)
  - 3GPP TS 25.305 (GSM & UMTS)
- JSR 179 (Location API) support
- Emergency priority override existing A-GPS service
- Performance requirement
  - TTFF (95% successful rate): < 20 seconds
  - 2D Location Error (95% successful rate): < 100 m
  - 3GPP TS 25.171 compliance (Requirement for support of Assisted Global Positioning System)
  - 3GPP 34.171 (Terminal conformance specification, Assisted Global Positioning System)
  - 3GPP TS 34.108 (Common test environments for User Equipment conformance testing)
- Fallback to Standalone mode when no network connection

**Motion G-sensor**
- Tri-Axis Accelerometer
- Resolution: 1.22 milli-g
- Auto portrait / landscape mode change when device orientation change
- Interface to compensate tilting effect

**FM Radio**
- Turing range: 76MHz~108MHz for Japan and 87.5Mhz ~ 108Mhz for the other regions
- FM sensitivity: 8uV @ (S+N)/N=26dB
- Auto channel search

**Digital Camera**
- Main camera
  - 3.2MP Color CMOS with auto focus function
  - Camera flash
- $2^{nd}$ camera: (manufacturing option)
  - Color CMOS VGA camera

**Keyboard/Button/Switch**
- Power button (Top Left Side)
  - Short Press: system on/off
  - Long Press: Turn off power totally
- One 5-way navigation pad with
  - 5-way navigator pad
  - Home
  - Back / Clear
  - Send / hands-free
  - End
- Volume Up/ Volume Down Buttons (Upper Left side)
- PTT/ Qchat button (for AT&T SKU only)
- 5-rows QWERTY keyboard
  - Two LEDs for Cap Lock & FN Lock on QWERTY keyboard
- Reset

**Notification**
- Notification by sound, vibration, navigator LEDs or status shown on the display

**Audio**
- Built-in Microphone
- Receiver
- Loud speaker with Hands-Free support
- Full duplex
- Audio sampling rate
  - 16-bits with 8KHz, 11KHz, 22KHz, 44.1KHz
- AMR/AMR WB/AAC/WAV/WMA/MP3 codec
- Audio Path Routing [Phone and VoIP]
  - Bluetooth [phone only]
  - Receiver
  - Speaker
  - Headset

**HAC**

**Connectivity & Interface**
- Bluetooth
  - Version 2.0 compliant with EDR
  - Class 2 transmit power
  - Supported profiles:
    - ✓ Generic Access profile
    - ✓ Serial Port profile
    - ✓ Headset profile
    - ✓ Object Push profile
    - ✓ PAN
    - ✓ Hands-free profile 1.5
    - ✓ Generic Object Exchange profile
    - ✓ A2DP
    - ✓ AVRCP
    - ✓ Service Discovery profile
    - ✓ HID profile
    - ✓ File Transfer Profile
    - ✓ Basic Printing Profile
    - ✓ Activesync-Over-Bluetooth
    - ✓ PBAP (Phone book access profile)
    - ✓ DUN (Dial-up profile)
  - Internet Sharing
  - Co-exist with WiFi
- WiFi
  - IEEE 802.11 b/g compliant
  - Internal WLAN antenna
  - Data rate auto fallback for extended range
  - ELP mode
  - Security 802.11i and AES
    - ✓ WPA authentication – WEP, WPA, PSK, EAP-TLS, PEAP, LEAP
    - ✓ Signaling interfaces between the terminal device and the servers: mutually authenticated

and encrypted utilizing TLS (RFC 2246) with RC4 encryption with SGA1 used as the message integrity check
- ♦ QoS
  - ✓ 802.11 WME QoS
  - ✓ 802.11e
- ♦ or no WiFi SKU

- USB 2.0 High Speed
  - ♦ USB 2.0 host thru dongle support
  - ♦ USB 2.0 client
  - ♦ 11-pin mini-USB
  - ♦ audio jack in one
  - ♦ TV out
  - ♦ HTC H2Wire support
  - ♦ Mass storage profile
- 1.8/ 3V USIM/SIM card slot
- 6-pin Golden finger [reserve design only]
- microSD Card Slot
  - ♦ Support microSDHC

**Power**

- Battery
  - ♦ Removable and Rechargeable battery, 1340 mAh
- Battery life
  - ♦ Playing WMV: 5.8 hours
  - ♦ Playing WMA: 6.9 hours
  - ♦ EU/ Asia SKU
    - ✓ GSM Talk time: 419 minutes
    - ✓ GSM Standby time: 367 hours
    - ✓ UMTS Talk time: 378 minutes
    - ✓ UMTS Standby time: 462 hours
  - ♦ US AT&T SKU
    - ✓ GSM Talk time: 445 minutes
    - ✓ GSM Standby time: 367 hours
    - ✓ UMTS Talk time: 397 minutes
    - ✓ UMTS Standby time: 462 hours
  - ♦ Video Telephony time: 189 minutes
  - ♦ VoIP talk time: 4 hours
  - ♦ VoIP standby time: 150 hours (Wi-Fi is on and associated with an access point.)
- AC adaptor
  - ♦ AC input: 100 ~ 240V AC, 50/60 Hz
- DC output: 5V and 1A
- Ambient Light Sensor

**Liquid Indicator**

**Stylus**

- Lock type mechanism with plug in /out detect function

**Hanger**

- Stylish hanger to wear phone with neck strap as pendant or to attach various phone hangers

**Accessories**

- Quick start guide [Inbox]
- CD (User manual & Sync. software) [Inbox]
- Screen protector [Inbox]
- Stylus [Inbox]
- Travel charger, TC P300 [Inbox]
- Mini-USB data cable, DC300 [Inbox]
- Standard battery [Inbox]
- Wired stereo headset, HS S300 [Inbox]
- Accessory leaflet [Inbox] (for HTC branded sku only)
- Pouch [Inbox]
- DoCoMo Aladdin adaptor (standard type) [Inbox, DoCoMo only]
- 3-in-1 stylus
- 3.5 mm audio adaptor with earphone, HS U110
- Wired remote controller with earphone, RC E100
- Mono Bluetooth Headset, BH M200
- Stereo Bluetooth Headset, BH S100
- Bluetooth Keyboard
- Multifunction audio cable
- Generic car holder
- Generic cradle
- Car upgrade kit (car charger and car holder)
- TV-out cable (composite video and audio)
- 3.5mm to 2.5mm audio converter for TTY/TDD device [US only]
- Extended battery with battery cover
- DoCoMo Aladdin Adaptor (service usage type) – will only be offered to service maintenance goods and not be offered to end users. [DoCoMo only]

**Compatibility Test:**

Below accessories are required to do the compatibility test

- Y-Cable 11 pin to 5pin + 6pin
- Y-Cable 11 pin to 5pin + 3.5 mm audio Jack
- Y-Cable 11-pin to 5-pin + 2.5 mm audio Jack
- Mono Bluetooth Headset, BH M100
- Handsfree Carkit : Parrot CK3400LS, Parrot MK6100, Parrot Minikit, Audi, BMW & Mercedes incar and Wavecom MB SAP solutions
- Bluetooth Conference: Parrot Conference
- Bluetooth Speaker: Parrot Boombox
  - ♦ SanDisk memory cards (including SDHC format)

**Microsoft Windows Mobile 6.1 Professional Applications**

- Microsoft Outlook Mobile
  - ♦ Messaging (SMS/E-mail), Contacts, Calendar, Tasks, Email Set Up Wizard
- Microsoft Internet Explorer Mobile
- Microsoft Media Player Mobile
- Microsoft ActiveSync
- Microsoft Windows Mobile Update
- Internet Sharing
- Pictures & Videos
  - ♦ Graphics: JPEG, GIF87a, GIF89a, PNG, WBMP
- Games
- File Explorer
- Device Management
- Security Enhancement
  - ♦ Storage Card Encryption
  - ♦ Device Lock

- Microsoft Office Mobile
  - ♦ Word Mobile, Excel Mobile, PowerPoint Mobile, OneNote Mobile
- Microsoft Windows Live!
  - ♦ Windows Live Messenger
  - ♦ Windows Live Mail (Push Mail)
  - ♦ Windows Live Contacts
  - ♦ Windows Live Search
  - ♦ Windows Live Spaces
- Microsoft Smart Dial
- Microsoft Remote Desktop Mobile [optional]

**Value-Added Applications [Generic]**

- Windows Mobile Enhancements
  - ♦ DirectShow Filters
    - ✓ Audio playback

| Codec | Extension | Profile |
|---|---|---|
| AAC | .aac/.m4a/.mp4/.3gp | LC profile |
| AAC+ | .aac/.m4a/.mp4/.3gp | |
| eAAC+ | .aac/ .m4a/ .mp4/3gp | |
| AMR-NB | .amr/.3gp | |
| AMR-WB | .awb/.3gp | |
| QCELP | .qcp/.3g2 | |
| EVRC | .qcp | |
| MIDI | .mid | |
| SP-MIDI | .mid | |
| MPEG4 | .m4a | |

- ✓ Video playback

| Codec | Extension | Profile |
|---|---|---|
| H.264 | .mp4/ .3gp/ .3g2/ .m4v | Baseline profile |
| H.263 | .3gp/ .3g2 | P0 profile |
| MPEG4 | .mp4 | Simple profile |
| Motion-JPEG | .avi | |

- ✓ H263, MPEG4: [XXX fps] decoding for [XXX] resolution

| Decoding performance in fps for MPEG-4 and H.263 | QVGA | VGA | WVGA |
|---|---|---|---|
| Qualcomm 7201A | 30 fps | 30 fps | 20 fps |

- ✓ H264: [XXX fps] decoding for [XXX] resolution

| Decoding performance in fps for H.264 | QVGA | VGA | WVGA |
|---|---|---|---|
| Qualcomm 7201A | 30 fps | 30 fps | 20 fps |

- ♦ Pictures & Videos enhancements
  - ✓ Link camera icon to in-house camera & camcorder application
  - ✓ Thumbnail view for video files:
    - ✧ AVI (.avi)
    - ✧ H.263 (.3gp)
    - ✧ H.263 (.3g2)
    - ✧ MPEG-4 (.mp4)
    - ✧ H.264 (.mp4/.3gp)
- ♦ Ring Tone enhancements
  - ✓ MIDI
    - ✧ 40 polyphonic & Standard MIDI format 0 and 1 (SMF) / SP MIDI
  - ✓ Ring Tone support codec (format):
    - ✧ eAAC+ (.aac)/ AAC+ (.aac)/ AAC (.aac)/ AMR-NB (.amr)/ AMR-WB (.awb)/ QCP (.qcp/.3g2)/ MIDI (.mid)/ MP3 (.mp3)/ MPEG4-Audio (.mp4)/ WMA (.wma)/ Wave (.wav)
- Telephony
- ♦ (HTC) Phone Canvas
  - ✓ Full screen incoming call alert
- ♦ (3G-324M) Video Telephone (not applicable for AT&T SKU)
  - ✓ 3GPP Release 99 3G-324M support
  - ✓ MPEG4/ H.263 Video and AMR-NB Audio Support
- Multimedia
- ♦ (HTC) Camera
  - ✓ Camera Mode
    - ✧ Encoding format: JPEG
    - ✧ Resolution: QXGA 2048x1536, UXGA 1600x1200, SXGA 1280x960, VGA 640x480, QVGA 320x240
    - ✧ Digital zoom up to 4x
  - ✓ Camcorder Mode
    - ✧ [XXX] fps encoding for [XXX] resolution

| Encoding performance in fps (for MPEG-4 and H.263) | QVGA | VGA | WVGA |
|---|---|---|---|
| Qualcomm 7201a | up to 24 | Don't support | Don't support |

- Encoding format

| Codec | Extension | Profile |
|---|---|---|
| MPEG4 + AMR-NB | .mp4 | Simple profile |
| H.263 + AMR-NB | .3gp | Profile 0 |

  - ✓ Effects: Grayscale, Sepia, Cool, Negative
  - ✓ "Property" adjustment
  - ✓ Camera Album access
- ♦ Album
- ♦ MP3 Trimmer
- ♦ Audio Booster
- ♦ Streaming Media Player
  - ✓ A 3GPP PSS based client solution
  - ✓ Support RTSP/RTP based streaming protocol
- ♦ FM Radio

- Web
  - ♦ Opera Browser
  - ♦ RSS Reader & Podcast
  - ♦ YouTube Client
- Input Method
  - ♦ EZ-INPUT
    - ✓ Prediction, completion and correction
    - ✓ Touch software keyboard
- Messaging
  - ♦ MMS Client
    - ✓ OMA MMS (v1.2 or above)
- GPS/LBS
  - ♦ Google Maps for Mobile
  - ♦ Quick GPS
- User Interface
  - ♦ Manila Tabs
    - ✓ Home
    - ✓ Programs
    - ✓ People
    - ✓ Messages
    - ✓ Mail
    - ✓ Photos & Videos
    - ✓ Music
    - ✓ Internet
    - ✓ Weather
    - ✓ Settings
  - ♦ TouchFLO
    - ✓ Random Access for Contact
    - ✓ Scroll
    - ✓ Gesture
  - ♦ Large Start Menu
  - ♦ Auto Power On when KB slide out
  - ♦ Sound Effect of Sliding
    - ✓ User customizable sounds
- Tools & Utilities
  - ♦ Task Manager
  - ♦ (HTC) Connection Setup
  - ♦ Voice Recorder
  - ♦ Zip
  - ♦ Document Viewer – PDF
  - ♦ OMA DRM Engine:
    - ✓ OMA 1.0
  - ♦ Java virtual machine
    - ✓ JSR 185 JTWI
    - ✓ JSR 75 PIM access
    - ✓ JSR 120 Wireless Messaging API
    - ✓ JSR 135 Mobile Media API
  - ♦ Voice Speed Dial
  - ♦ Long Press End Key Menu
  - ♦ STK
  - ♦ SIM manager
  - ♦ TTY (for US market only)
  - ♦ TV out settings
  - ♦ (HTC) Volume Control
  - ♦ Business Card Reader
  - ♦ Printing
    - ✓ Materials
      - ✧ Word, Excel, Power Point, E-mail, Notes
    - ✓ PictBridge support

**Value-Added Applications [Non-Generic]**

- Tools & Utilities
  - ♦ Backup Tool
  - ♦ GPS/LBS
    - ✓ On board navigation

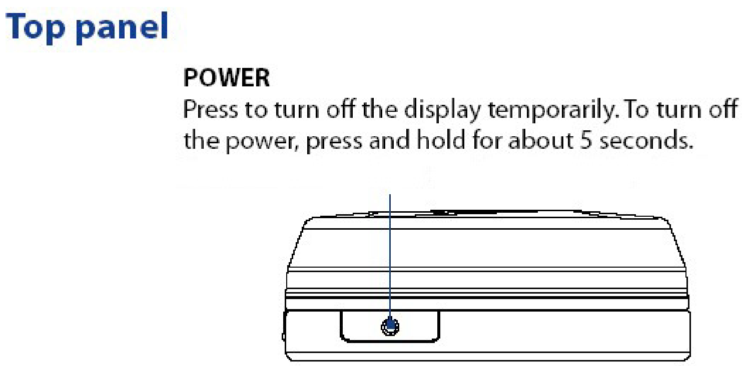
**Value-Added Applications [TBD]**

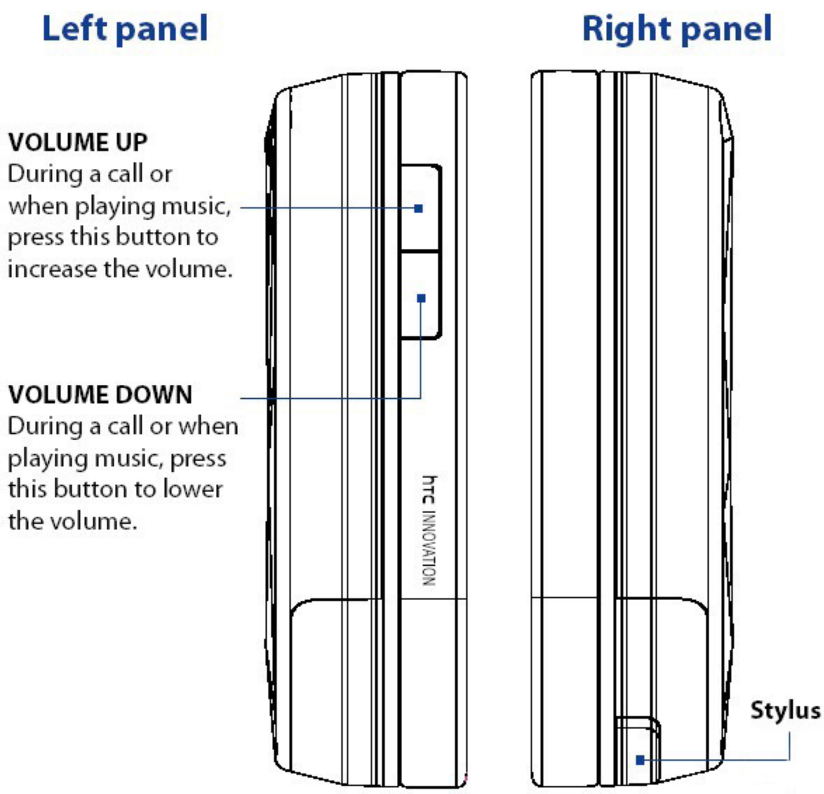
- Web
  - ♦ Opera Browser
    - ✓ HTC Multi-Tab
- User Interface
  - ♦ (HTC) Lock Screen

**Regulatory & Certificate**

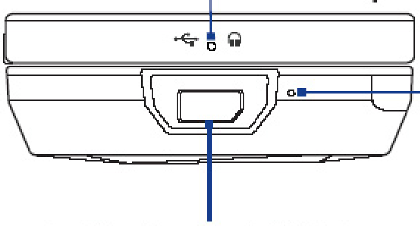
- GCF certification [Operator dependent]
- R&TTE: EMC / EMI, Safety SAR
- WiFi Certification
- FCC Approval
- FCC Hearing Aid Compatibility
- PTCRB Approval
- BQB (Bluetooth Qualification Body) certification
- Windows Mobile Logo (NTSL)
- USB certification
- CB certificate / report
- UAELAB
- ICASA

## 1.2 Product overview



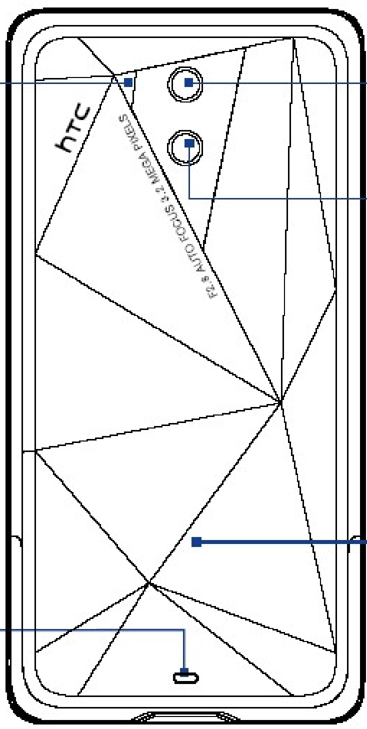
## Bottom panel



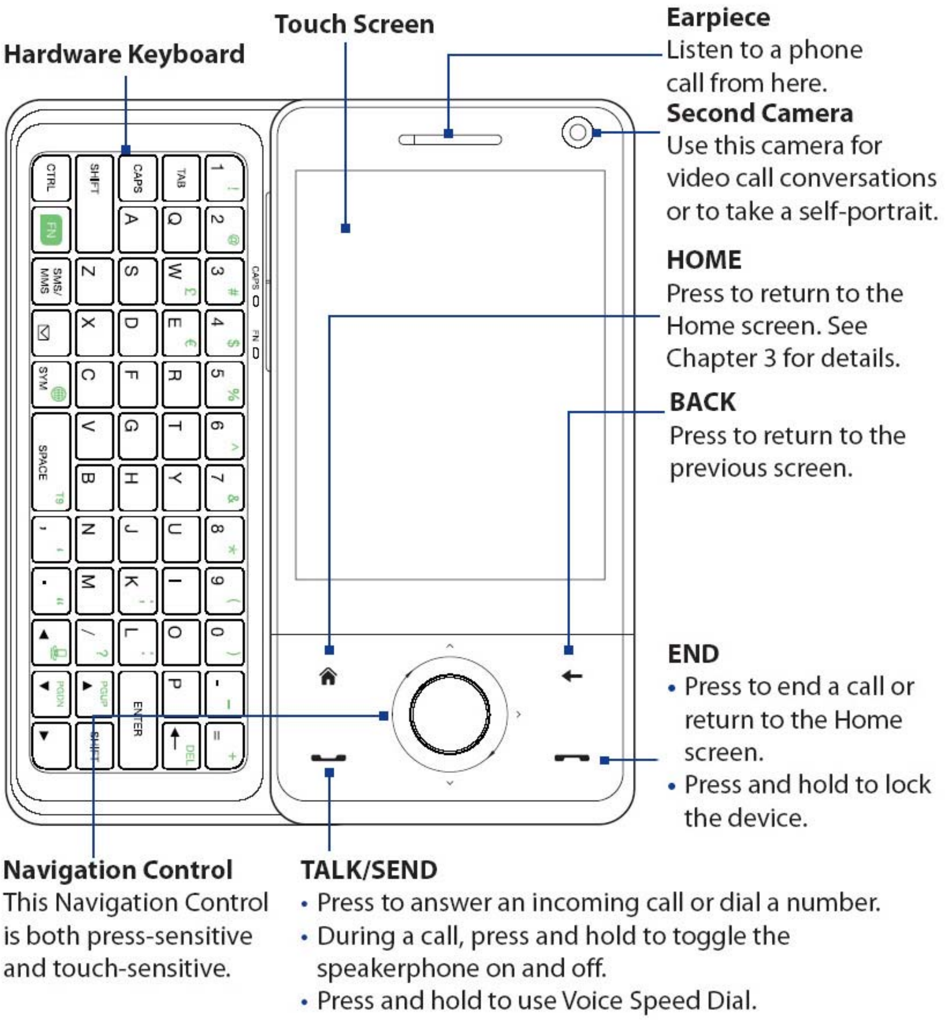

**Sync Connector/Earphone Jack/TV Out**

- Connect the supplied USB cable to synchronize information or plug in the AC adapter to recharge the battery.
- Connect the supplied USB stereo headset for hands-free conversation or for listening to audio media.
- Connect an HTC composite video and audio cable (purchased separately) to output the device screen contents and device audio to an external viewing device.

## Back panel



## Front panel




**Notes** When using the four buttons — HOME, BACK, TALK/SEND, and END — and the Navigation Control, please observe the following precautions:

- Make sure to press on the icons of the four buttons for the best accuracy. When pressing on the Navigation Control, make sure to press the outer areas near the ENTER button for directional control.
- For best results, press with your fingertip. Do not wear gloves.

The buttons below the touch screen and the exterior edge of the Navigation Control which is an LED ring will light up in the following situations:

| Controls | Light Behavior |
| --- | --- |
| **SEND button** | Light flashes when there is an incoming call. |
| **END button** | Light stays solid when there is an incoming call. |
| **Navigation Control** | • The LED ring shows a "breathing" white light when the battery is being charged.<br>• The LED ring shows a solid white light when the battery is fully charged.<br>• The LED ring flashes a white light once when the battery level is low and reaches down to about 10%.<br>• The top and bottom parts of the LED ring flashes a white light twice when there is a new e-mail, voice mail, or meeting reminder.<br>• A white light goes around the LED ring counterclockwise twice starting from the top when there is a missed call or new SMS or MMS message. |

The LED ring, HOME, BACK, SEND, and END buttons will flash a white light once when one of the buttons or Navigation Control is pressed.

- **Installing the SIM card**

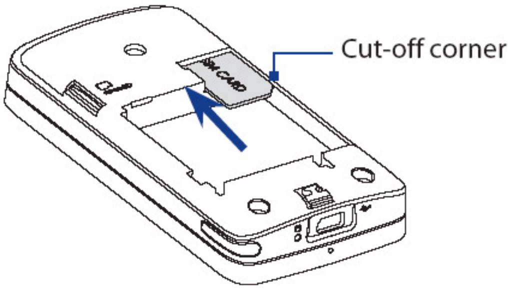
## SIM card

The SIM card contains your phone number, service details, and phonebook/ message memory. Your device supports both 1.8V and 3V SIM cards.

**Note** Some legacy SIM cards may not function with your device. You should consult with your service provider for a replacement SIM card. There may be fees for this service.

### To install the SIM card

1. Make sure your device is turned off.
2. Locate the SIM card slot, then insert the SIM card with its gold contacts facing down and its cut-off corner facing out the card slot.
3. Slide the SIM card completely into the slot.




### To remove the SIM card

1. Remove the battery if it is installed.
2. Slide the SIM card out from the SIM card slot with your thumb.

- **Installing the SD card**

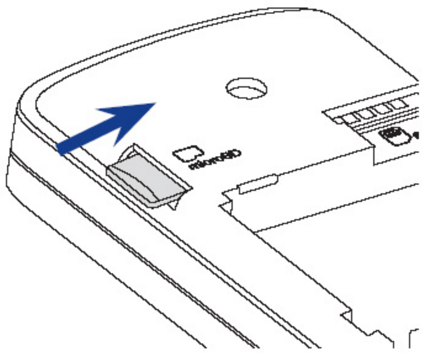
## Storage card

To have additional storage for your images, videos, music, and files, you can purchase a microSD™ card and install it into the your device.

### To install a microSD card

Insert the microSD card into the slot with its gold contacts facing down.

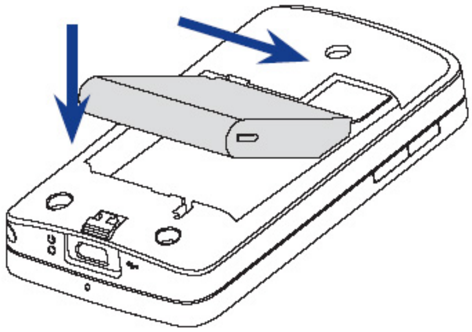
**Note** To remove the microSD card, press it to eject it from the slot.



- **To install / remove the battery**

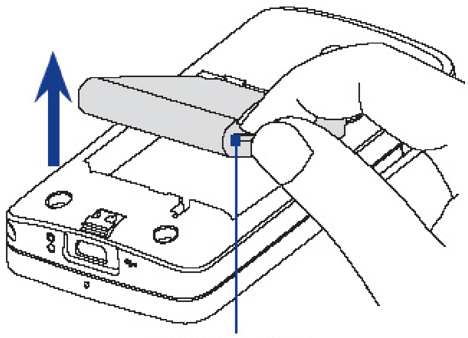
## To install the battery

1. Align the battery's exposed copper contacts with the battery connectors inside the battery compartment.
2. Insert the contact's side of the battery first and then gently push the battery into place.
3. Replace the back cover.



## To remove the battery

1. Make sure your device is turned off.
2. Remove the back cover.
3. The bottom right side of the battery has a protruding grip. Lift the protruding grip to remove the battery.



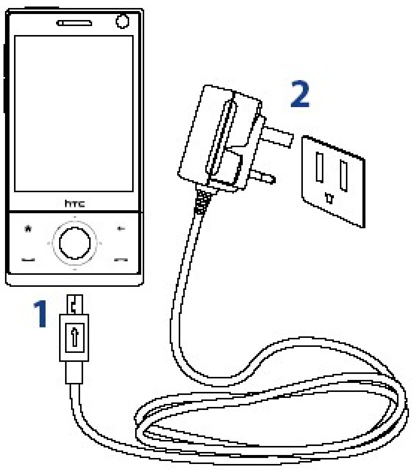
- **Charging the battery**

New batteries are shipped partially charged. Before you start using your device, it is recommended that you install and charge the battery. Some batteries perform best after several full charge/discharge cycles.

**To charge the battery**

1. Connect the USB connector of the AC adapter to the sync connector on your device.
2. Plug in the AC adapter to an electrical outlet to start charging the battery.

**Note** Only the AC adapter and USB sync cable provided with your device must be used to charge the device.




Charging is indicated by a "breathing" white light around the Navigation Control. As the battery is being charged while the power is on, a charging icon also appears in the title bar of the Home screen. After the battery has been fully charged, the Navigation Control LED shows a solid white light and a full battery icon appears in the title bar of the Home screen.

For more information about the Navigation Control LED, see "LED Alerts" in this chapter.

**Warning!**
- Do not remove the battery from the device while you are charging it using the AC or car adapter.
- As a safety precaution, the battery stops charging when it overheats.

- **To perform a soft reset**

1. Remove the back cover.
2. Pull out the stylus.
3. Use the stylus to press the RESET button located between the opening of the stylus compartment and USB connector on the back of the device. Your device restarts and displays the Today screen.

- **To perform a hard reset**

**Warning!** Your device will be set back to factory default settings. Please ensure any additional installed programs and/or user data have been backed up before a hard reset is performed.

1. Pull out the stylus
2. With the device turned on, press and hold the VOLUME DOWN and ENTER buttons, then press the RESET button with the stylus tip.
3. Release the RESET button, but continue pressing the VOLUME DOWN and ENTER buttons until you see this message on the screen:

```
This operation will delete
all your personal data,
and reset all settings
to manufacturer default.
Press VolUp to restore
manufacturer default, or
press other keys to cancel.
```

4. Release the VOLUME DOWN and ENTER buttons, then press the VOLUME UP button to perform the hard reset, or press any other button to cancel the reset.

# 2. Device Disassembling and Assembling Procedure

## 2.1 Tools list

| level | No. | Item | Vendor | P/N |
|---|---|---|---|---|
| L 1 | 1 | Mini USB DATA interface Cable | | |
| | 2 | Earphone Headset | | |
| | 3 | AC Adapter | | |
| | 4 | WLAN AP | | |
| | 5 | Level 2 Memory Card with Diag. test program (need be encoded by HTC) | HTC design | DCT-00050 |
| | 6 | Level 0 Memory Card with Diag. test program (need be encoded by HTC) | HTC design | DCZ-00050 |
| | 7 | 3pin battery holder | HTC special tools | MLT-00006 |
| | 8 | Universal Leakage Current Tester | HTC special tools | MLT-00001 |
| | 9 | Power supply | | |
| | 10 | Current Meter | | |
| | 11 | Mobile tester | | |
| L 2 | 12 | Special Made Plastic Stick | HTC special tools | RTT-00006 |
| | 13 | Hand tools | | |
| | 14 | Oven for rework purpose | HTC special tools | RTT-00007 |
| | 15 | Mylar,Assembly jig, for navi and TW,black, Raphael | | 76H02974-00M |
| | 16 | Mylar,Assembly jig, for navi and A-cover,black, Raphael | | 76H02973-00M |
| | 17 | Navi board keycap assembly jig | HTC special tools | RTT-00016 |
| | 18 | Barcode label printer (**400dpi** resolution and up) | | |
| L 2.5 | 19 | Lead-free Soldering station | | |
| | 20 | Hot air gun | | |

## 2.2 Disassembling procedure

| | |
|---|---|
|     | 1. PHILLIPS SCREW-DRIVER 00X50<br>2. FLAT PLASTIC STICK (P/N: RTT-00006)<br>3. CLEANING CLOTH<br>4. PLASTIC TWEEZERS<br>5. ESD WRIST STRAP. |
|     | 6. KEYCAP ASSEMBLY FIXTURE (P/N: RTT-00016 )<br><br>7. OVEN FOR REPAIR / REWORK PURPOSE (P/N: RTT-00007) |
|     | 8. MYLAR FOR KEYCAP GAP CONTROL (P/N: 76H02974-00M)<br><br>9. MYLAR FOR KEYCAP GAP CONTROL (P/N: 76H02973-00M) |





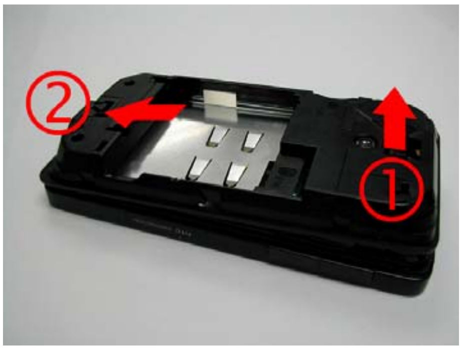
1. TAKE OUT THE STYLUS.
2. REMOVE THE BATTERY COVER AS SHOWN.





1. TAKE OUT THE BATTERY AS SHOWN.
2. LOOSEN 4 SCREWS FROM THE HOUSING.

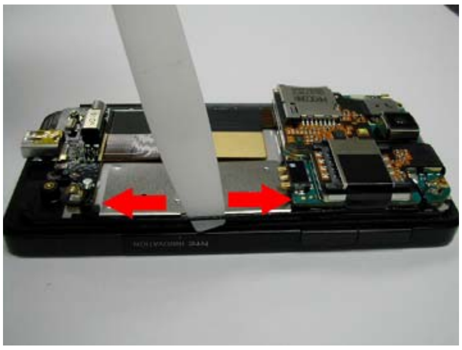




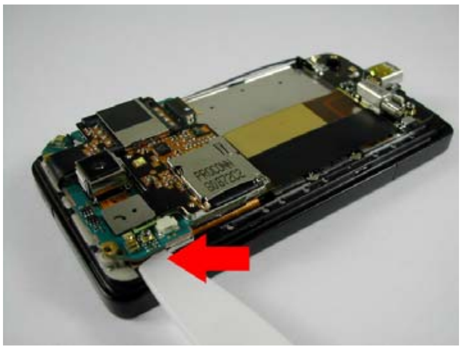
1. EXTEND THE KEYBOARD BY SLIDING THE DISPLAY UP.
2. INSERT THE FLAT PLASTIC STICK BETWEEN THE HOUSING AND QWERTY KEYBOARD AND THEN FOLLOW THE ARROW DIRECTION.
3. DISASSEMBLE THE HOUSING AS SHOWN.



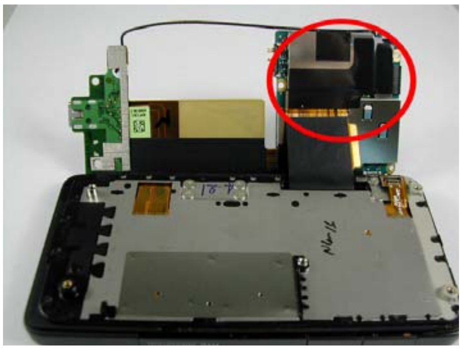

1. DISCONNECT THE SPEAKER CONNECTOR AT THE LOCATION INDICATED.
2. REMOVE THE SOUND COVER BY LIFTING IT UP.

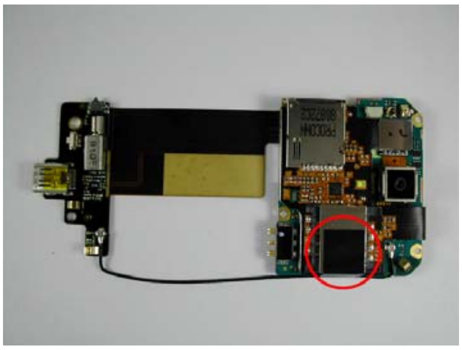
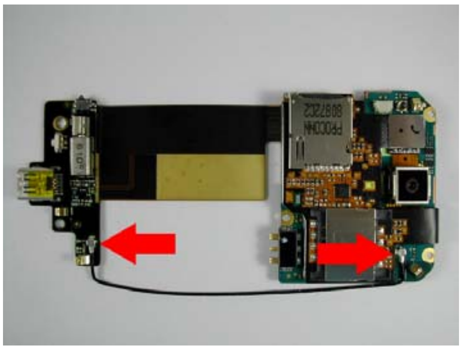
1. REMOVE THE SPEAKER BY LIFTING IT UP.
2. RELEASE THE ANTENNA WIRE AS SHOWN.

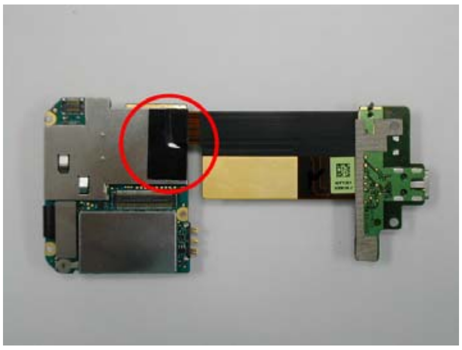
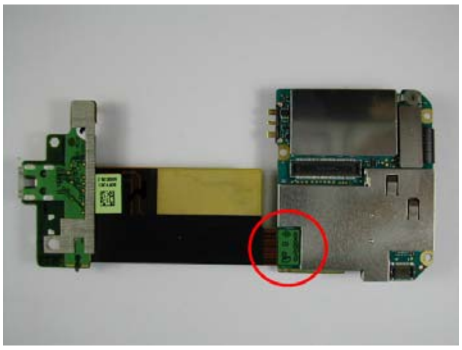
1. LOOSEN THE SCREW AT THE LOCATION INDICATED.
2. DISCONNECT QWERTY KEYBOARD CONNECTOR FROM THE MB.



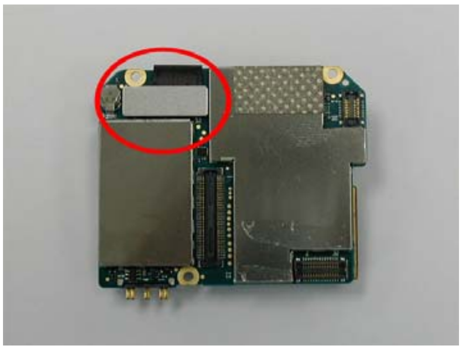

1. REMOVE THE MYLAR AT THE LOCATION INDICATED.
2. DISCONNECT THE MAIN FPC FROM THE M/B.

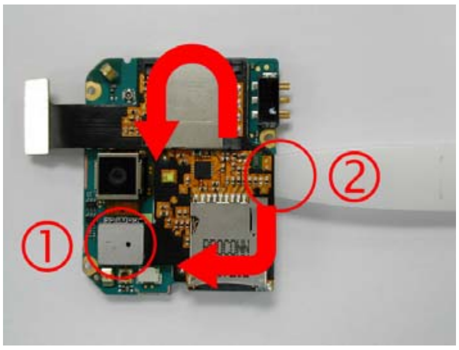



1. REMOVE THE MYLAR AT THE LOCATION INDICATED.
2. DISCONNECT THE ANTENNA WIRE AT THE LOCATION INDICATED.

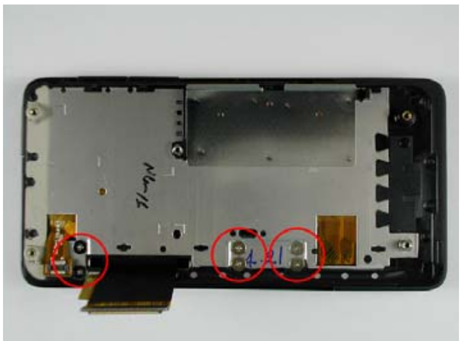
1. REMOVE THE MYLAR AT THE LOCATION INDICATED.
2. DISCONNECT THE I/O BOARD CONNECTOR.



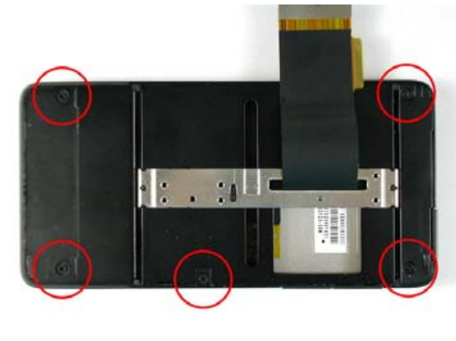


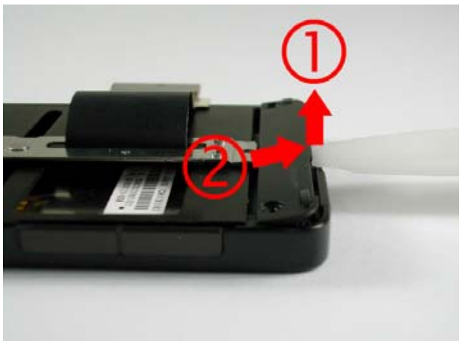

1. DISCONNECT THE SIM FPC CONNECTOR.
2. DISCONNECT THE MAIN CAMERA CONNECTOR.
3. INSERT THE FLAT PLASTIC STICK BETWEEN THE SIM FPC AND SHIELDING COVER AND THEN FOLLOW THE ARROW DIRECTION TO SEPARATE THE SIM FPC.



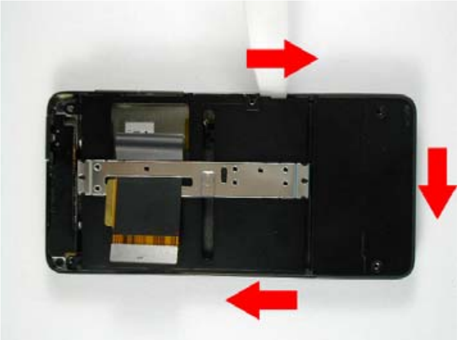


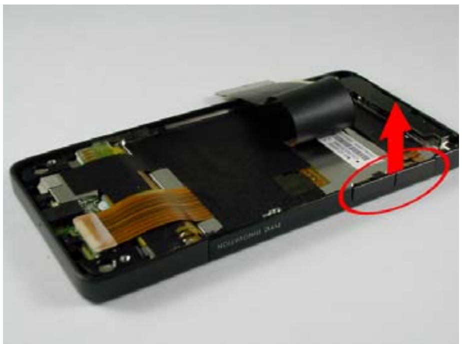
1. INSERT THE FLAT PLASTIC STICK AS SHOWN TO SEPARATE THE MAIN CAMERA AND THE MAIN BOARD.
2. LOOSEN 6 SCREWS AT THE LOCATION INDICATED.



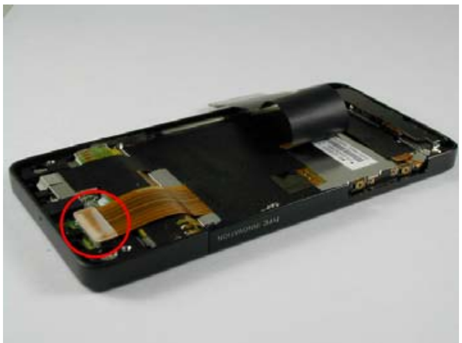


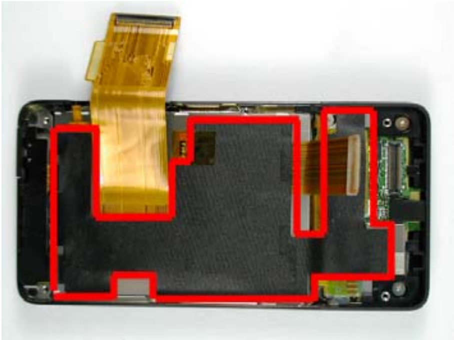

1. LOOSEN 5 SCREWS FROM B-COVER AND B-UPPER COVER
2. DISASSEMBLE THE B-UPPER COVER AS SHOWN.



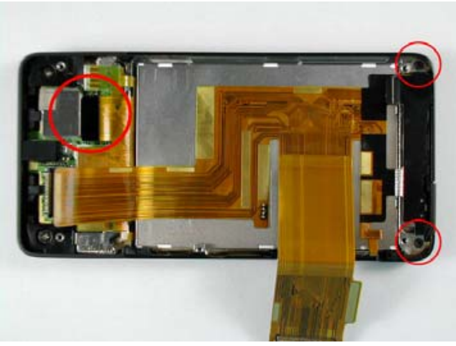


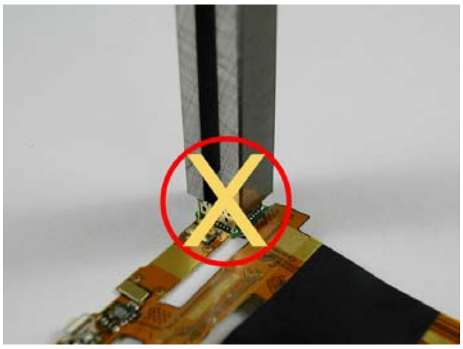
1. DISASSEMBLE THE B COVER AS SHOWN
2. TAKE OUT THE VOLUME KEY AS SHOWN.





1. DISCONNECT THE MAIN FPC CONNECTOR FROM NAVI KEY ASSEMBLY.
2. REMOVE THE CONDUCTIVE FABRIC AT THE LOCATION INDICATED

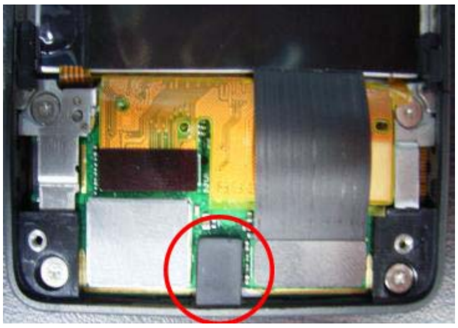
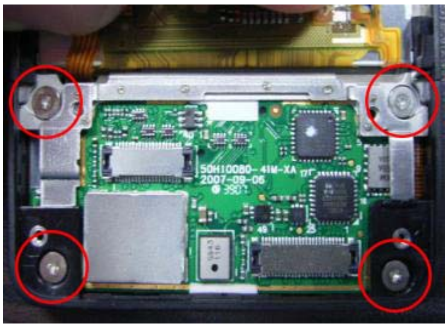




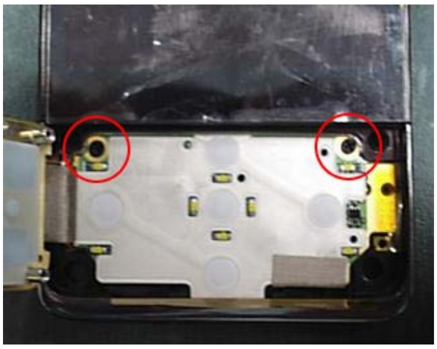
1. DISCONNECT THE LCM CONNECTOR AND LOOSEN THE TWO SCREWS FROM THE MAIN FPC.
2. DO NOT DISASSEMBLY THE 2ND CAMERA, REPLACE BOTH THE FPC AND 2ND CAMERA AT THE SAME TIME IF ONE OF THEM WAS FAILED (FOR MODEL WITH 2ND CAMERA)




1. TAKE OUT THE POWER BUTTON.
2. TAKE OUT THE RECIEVER AT THE LOCATION INDICATED.

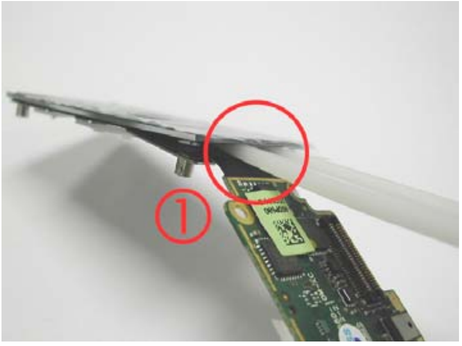
1. TAKE OUT THE MICROPHONE RUBBER AT THE LOCATION INDICATED.
2. LOOSEN 4 SCREWS FROM THE NAVI KEY ASSEMBLY AT THE LOCATION INDICATED.



LOOSEN ANOTHER 2 SCREWS AT THE LOCATION INDICATED.

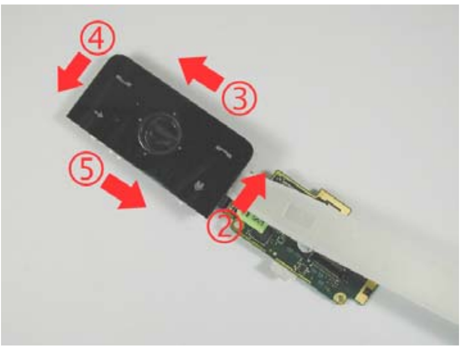
NOTE: BELOW STEPS CAN BE DONE BY AUTHORIZED SERVICE PROVIDER ONLY AFTER SAFE LAUNCH.

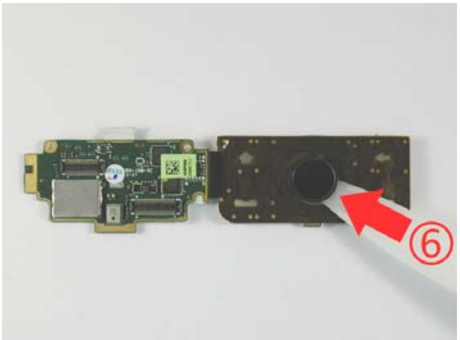





PUT THE NAVI PRE ASSY INTO AN OVEN ABOUT 5 MINUTES AT 65 DEGREE CELCIUS.

INSERT THE FLAT PLASTIC STICK BETWEEN THE KEY CAP AND THE FPC AS SHOWN.



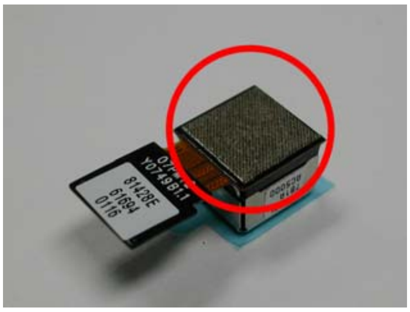



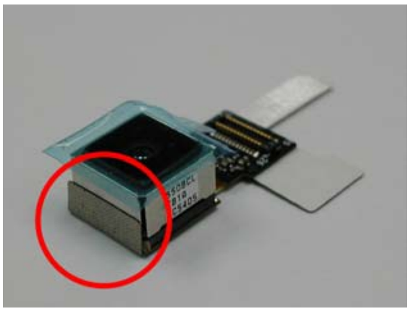

CONTINUE ABOVE STEP AND FOLLOW THE ARROWS DIRECTION TO SEPARATE THE NAVI KEY CAP AND THE FPC.

INSERT THE FLAT PLASTIC STICK BETWEEN THE CENTER NAVI KEY CAP AND THE FPC AS SHOWN TO SEPARATE THEM

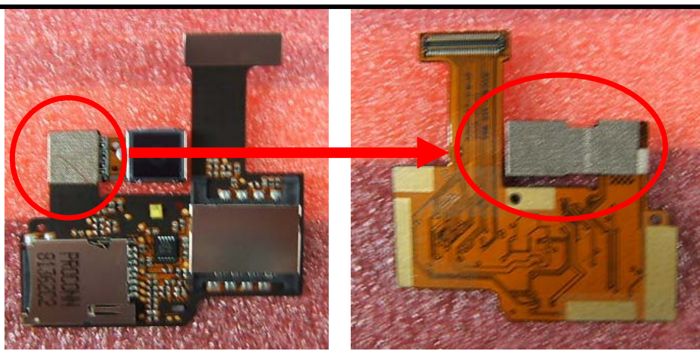
The Disassemble process is done

## 2.3 Assembling procedure

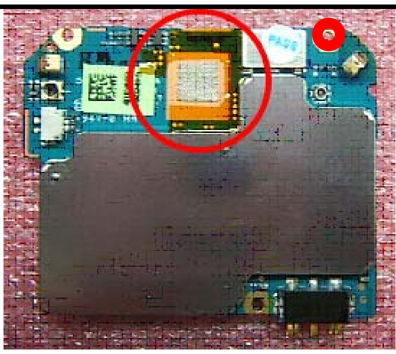




1. Remove the conductive fabric on the main camera at the location indicated.
2. Paste a conductive fabric (72H02844-0M) on the main camera at the location indicated.



1. Connect the main camera to SIM FPC and stick the conductive fabric on it.

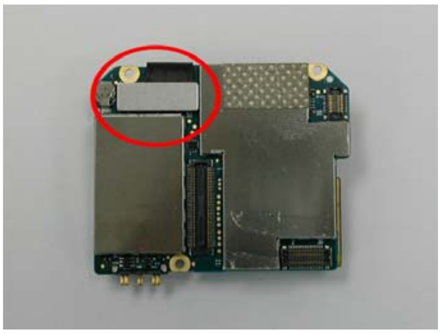
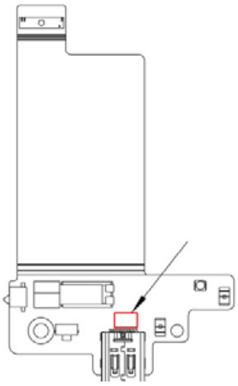
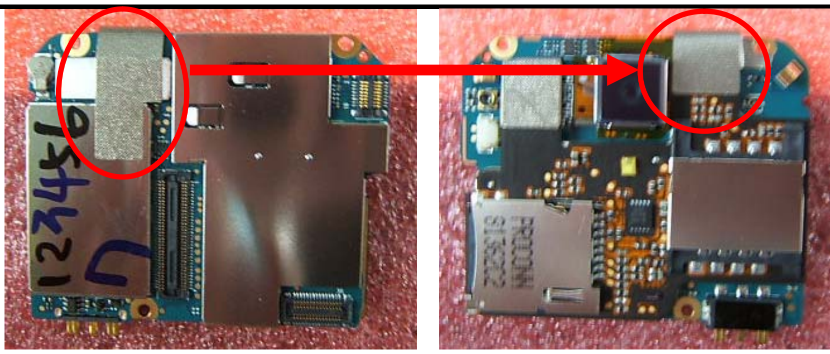
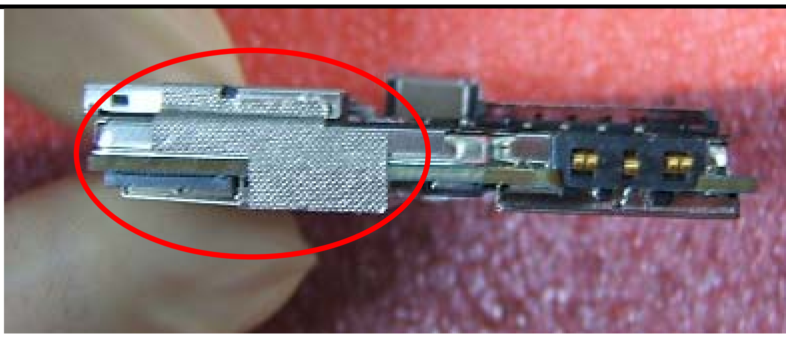


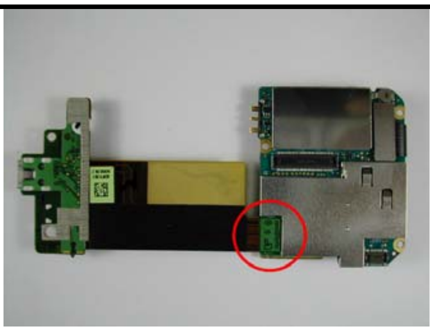


1. Make sure the mylar (76H02625-00M) and the conductive fabric (72H02843-00M, 76H03122-00M) was attahced at the location indicated.
2. Stick the SIM FPC to the main board at the location indicated

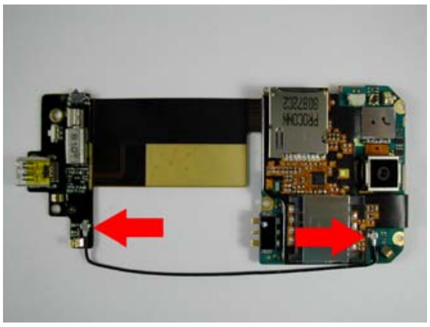
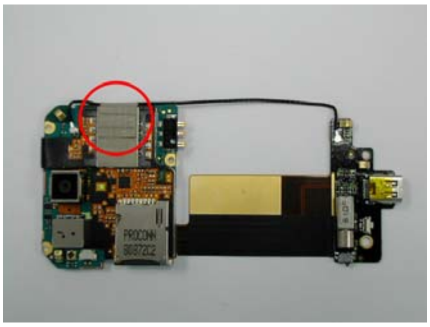
Note:

A. Do not bend the SIM FPC
B. Do not touch the double sided tape
C. Make sure the shielding cover surface is clean

| | |
|---|---|
|   | 1. CONNECT THE SIM FPC CONNECTOR TO THE MAIN BOARD.<br>2. PASTE A LDI (77H00668-00M) AT THE LOCATION INDICATED. |
|  | PASTE A CONDUCTIVE FABRIC (76H02985-00M) AT THE LOCATION INDICATED. |
|  | PASTE A CONDUCTIVE FABRIC (72H02845-00M) AT THE LOCATION INDICATED. |




1. CONNECT THE I/O BOARD CONNECTOR TO THE M/B
2. STICK A MYLAR (76H02770-00M) AT THE LOCATION INDICATED

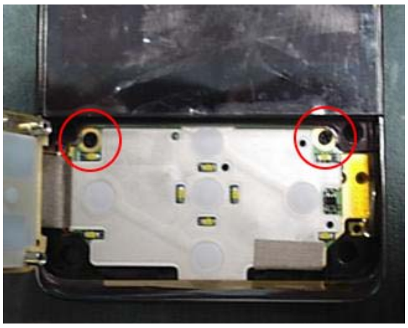
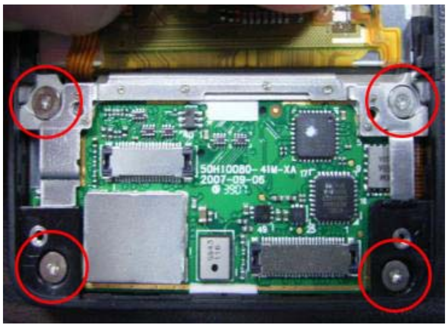



1. CONNECT THE ANTENNA WIRE AT THE LOCATION INDICATED.
2. FIX THE ANTENNA WIRE WITH A CONDUCTIVE FABRIC (72H02703-00M) AT THE LOCATION INDICATED.




1. INSTALL THE RECEIVER AT THE LOCATION INDICATED.
2. STICK THE LIGHT SENSOR LENS AT THE LOCATION INDICATED.

NOTE: MAKE SURE THE SPEAKER'S CONTACT SPRING IS FACING OUTSIDE

1. ASSEMBLE THE NAVI KEY AND TIGHTEN 2 SCREWS AT THE LOCATION INDICATED (P/N: 72H02450-00M). TORQUE: 0.5 ±0.1 KGF-CM
2. TIGHTEN 4 SCREWS AT THE LOCATION INDICATED (P/N: 72H02689-00M). TORQUE: 0.7 ±0.1 KGF-CM






1. ASSEMBLE THE NAVI KEY CAP AS SHOWN. PRESS THE KEY CAP FIRMLY.
2. REMOVE ALL OF THE MYLAR AFTER ASSEMBLY PROCESS IS DONE.

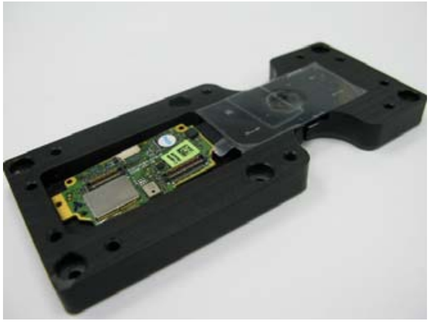
NOTE: DO NOT TOUCH THE DOUBLE SIDED TAPE & FPC AREA WHILE ASSEBLE THE NAVI KEYCAP AND MAKE SURE THE SURFACE OF THE NAVI KEY FPC IS CLEAN.






NOTE:

3. PLEASE PASTE MYLAR NO. 2 & 3 AT THE LOCATION INDICATED IF THERE IS NO MYLAR ON THE BEZEL
4. CLEAN THE NAVIKEY FPC SURFACE WITH LABORATORY ALCOHOL (95% AND UP) WHILE DOING KEYCAP REWORK.

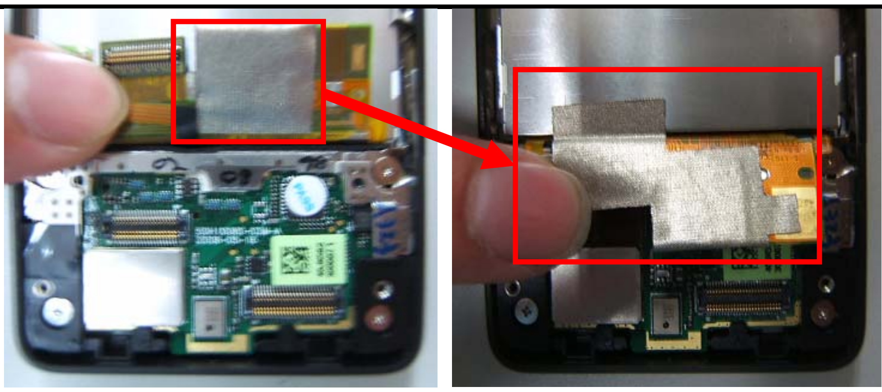




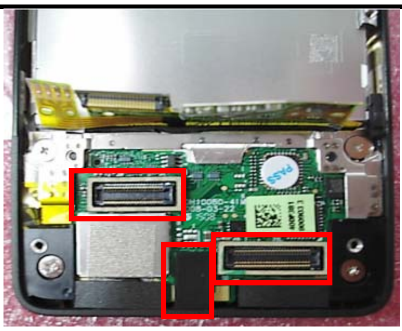
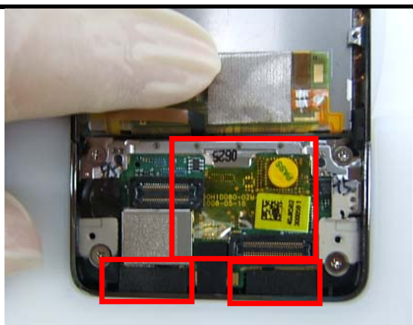

1. DISASSEMBLE THE NAVI BOARD
2. PRESS THE KEYCAP WITH THE KEYCAP JIG AS SHOWN.
3. RE-ASSEMBLY THE NAVI BOARD TO THE BEZEL.



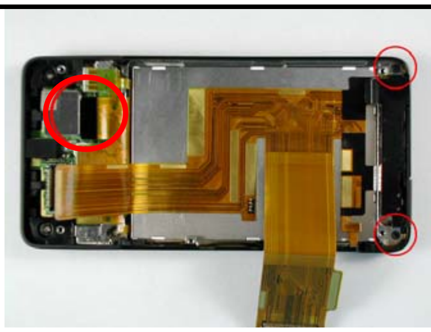
FOLD AND PASTE THE TRANSPARENT TAPE AT THE LOCATION INDICATED.



STICK A CONDUCTIVE FABRIC (72H02749-00M) TO THE LCD FPC AS SHOWN

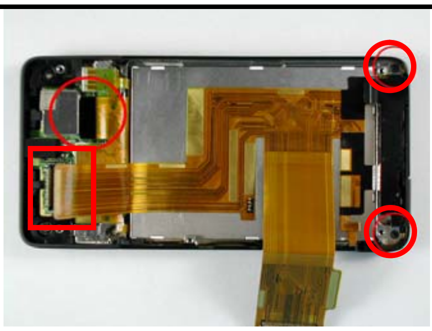



1. PLACE THE MICROPHONE RUBBER AT THE LOCATION INDICATED
2. STICK 2 SPONGE AT THE LOCATION INDICATED (76H02982-00M, 76H02983-00M) AND REMOVE THE RELEASE-TAPE.
3. PASTE A KAPTON TAPE (76H02823-00M) AND TWO SPONGE (76H02981-00M) AT THE LOCATION INDICATED.

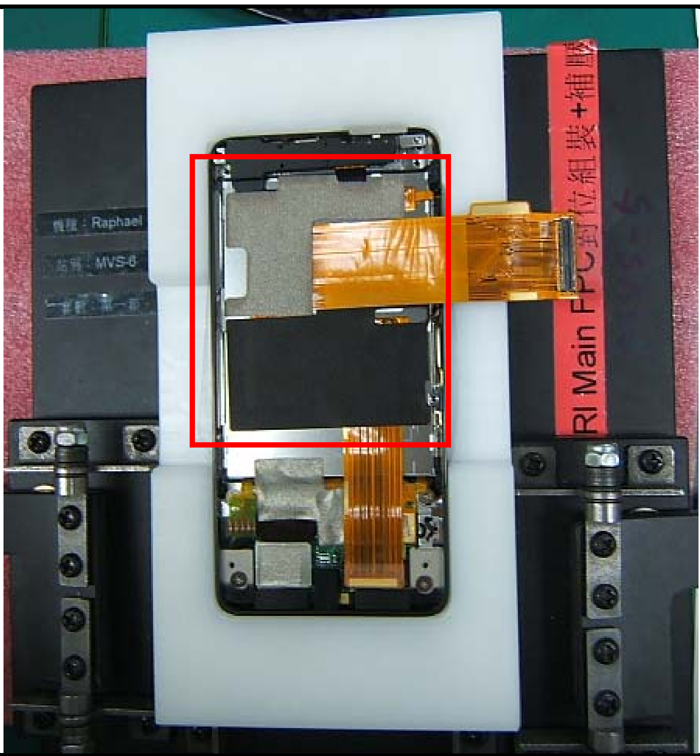



1. ASSEMBLE THE POWER BUTTON AT THE LOCATION INDICATED.
2. CONNECT THE LCM CONNECTOR TO THE NAVI BOARD.

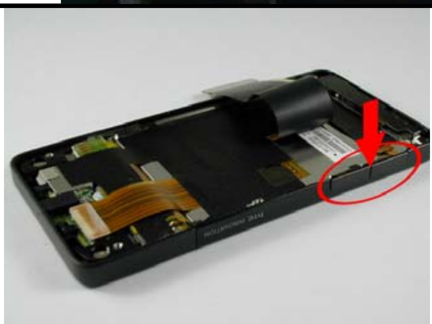
NOTE: REPLACE BOTH THE FPC AND THE 2ND CAMERA AT THE SAME TIME IF ONE OF THEM WAS FAILED

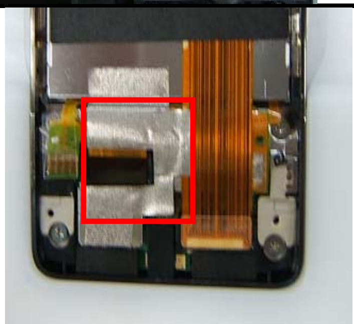



1. CONNECT THE MAIN FPC CONNECTOR TO THE NAVI BOARD, STICK THE FPC AND TIGHTEN THE MAIN FPC SCREWS AT THE LOCATION INDICATED (P/N: 72H02450-00M). TORQUE: 0.4 ±0.1 KGF-CM
2. STICK THE VOLUME FPC AT THE LOCATION INDICATED.




PASTE 2 CONDUCTIVE FABRICS (72H02854-00M & 72H02855-00M) AT THE LOCATION INDICATED.

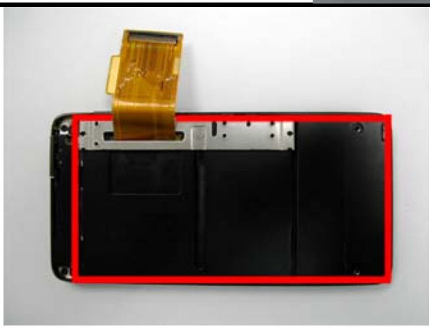




1. INSTALL THE VOLUME KEY AT THE LOCATION INDICATED.
2. STICK A GASKET (72H02816-00M) AT THE LOCATION INDICATED.



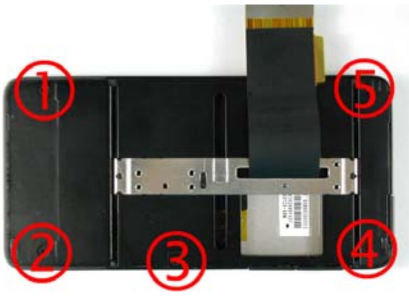
1. Stick a damper on B part at the location indicated.



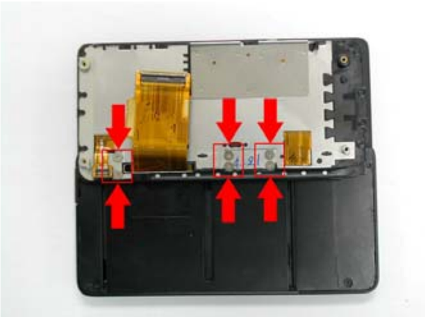
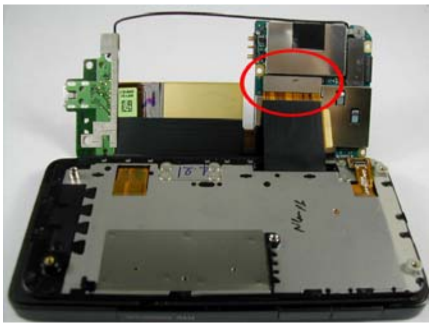
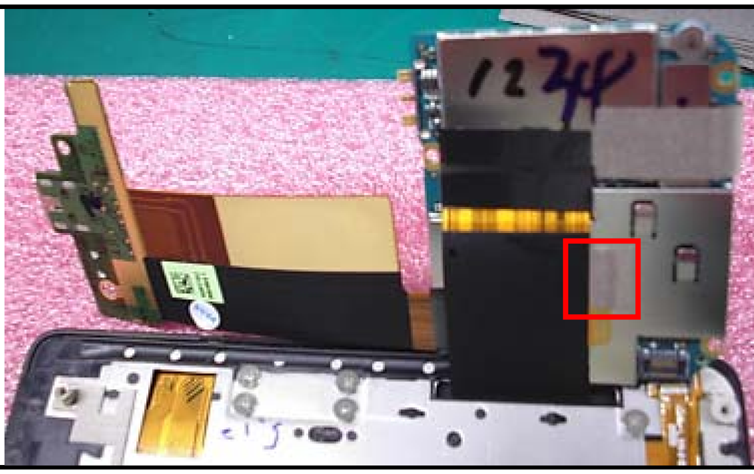


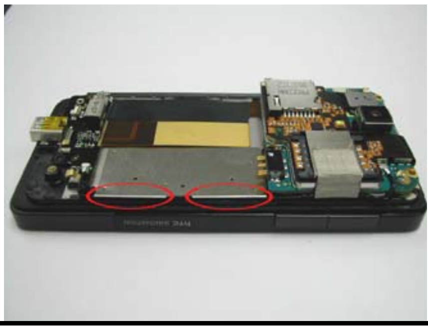
1. Assemble the B-cover as shown.
2. Insert a damper at the location indicated




1. Assemble B-upper cover as shown.
2. Tighten 5 screws at the location indicated (P/N: 72H02450-00M for screw No. 1, 2, 3 → Torque: 0.4 ± 0.1 kgf-cm and 72H01893-00M for screw No.4, 5 → Torque: 0.7 ±0.1 kgf-cm)

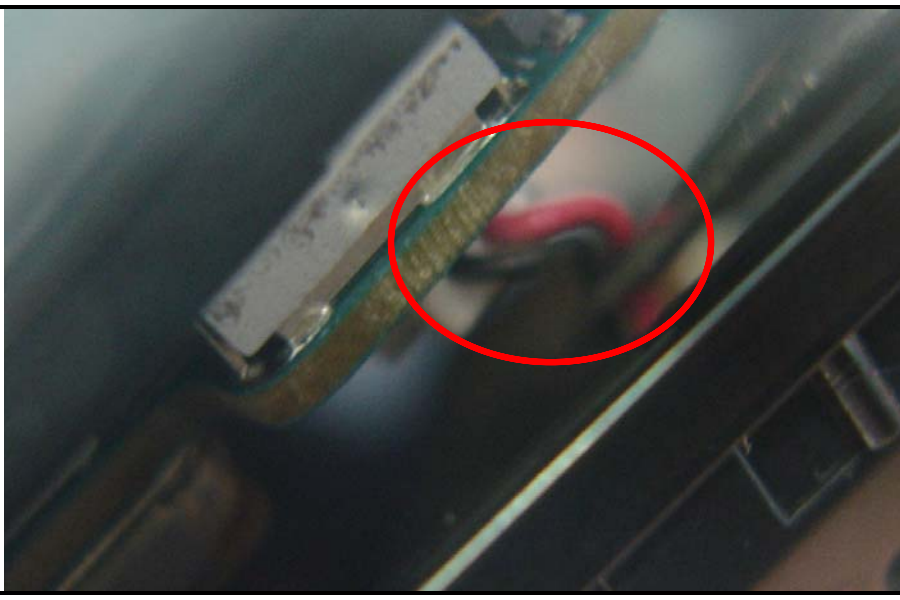
| | |
|---|---|
|   | 1. Assemble the QWERTY keyboard as shown.<br>2. Tighten 6 screws at the location indicated (P/N:72H02865-00M). Torque: 0.8 ±0.1 kgf-cm<br>3. Connect the main FPC connector to the M/B. |
|  | Stick a conductive fabric (72H02819-00M) at the location indicated |
|   | 1. Connect the QWERTY keyboard connector to the M/B<br>2. Fix the M/B with a screw at the location indicated (P/N: 72H02886-00M). Torque: 0.4 ±0.1 kgf-cm |




1. INSERT THE ANTENNA WIRE AT THE LOCATION INDICATED.
2. STICK A GASKET (76H02984-00M) AT THE LOCATION INDICATED




1. ASSEMBLE THE HOUSING AS SHOWN.
2. CONNECT THE SPEAKER TO THE M/B AT THE LOCATION INDICATED.



NOTE: USE TWEEZERS TO KEEP THE POSITION OF THE SPEAKER WIRES LOWER THAN THE MAIN BOARD AND KEEP AWAY FROM THE CONNECTOR TO PREVENT THE WIRES BEING PRESSED DURING ASSEMBLY.

<table>
<tr><td> </td><td>

1. PRESS THE HOUSING ARROUND TO FIX THE HOUSING.
2. TIGHTEN 4 SCREWS AT THE LOCATION INDICATED (P/N: 72H02474-00M). TORQUE: 1.0 ±0.1 KGF-CM

</td></tr>
<tr><td> </td><td>

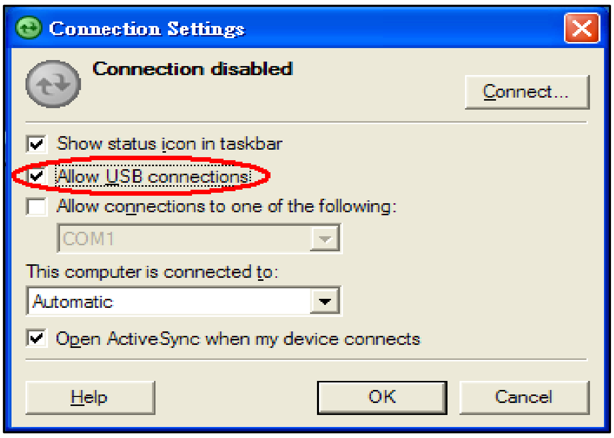
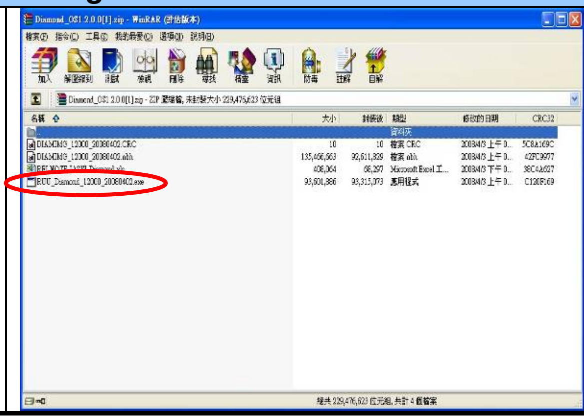
1. PUT THE BATTERY INTO THE BATTERY COMPARTMENT AS SHOWN.
2. PUT THE BATTERY COVER BACK AS SHOWN.

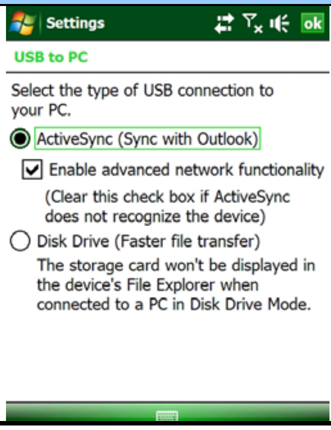
</td></tr>
<tr><td></td><td>PUT THE STYLUS BACK TO ITS PLACE.</td></tr>
</table>

The Assemble Process is Done. You may perform the Function Test or the following process.

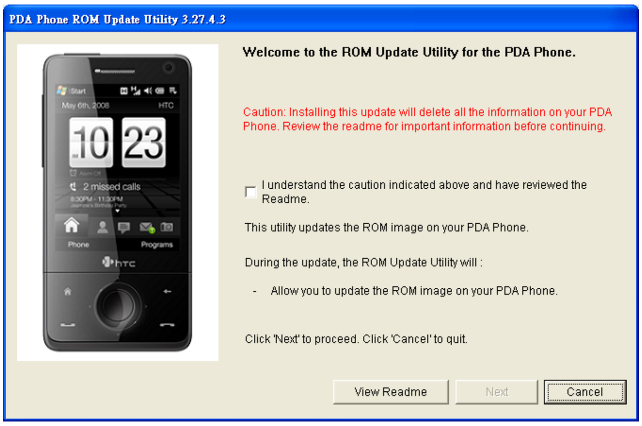
# 3. ROM Re-flash Procedure

## 3.1 ROM upgrade thru RUU (Re-flash Upgrade Utility)

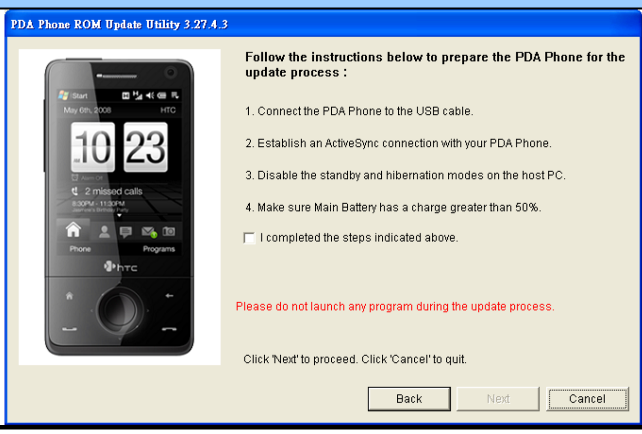
| **Connect device to PC** | |
| --- | --- |
| 1. Setting and allow USB connections in Microsoft ActiveSync.<br>2. Connect your device and desktop/ or laptop via USB cable.<br>3. Check the pop-up message from Microsoft ActiveSync when device is synchronized with PC. |  |
| **Download OS Image from SDO** | |
| 4. Download OS image from SDO. http://htcscm10.htc.com.tw/SDO<br>5. Un-zip the file and execute RUU program. |  |

| Check the setting of menu | |
|---|---|
| 6. Select the type of USB connection with "ActiveSync" mode in the settings of menu. |  |



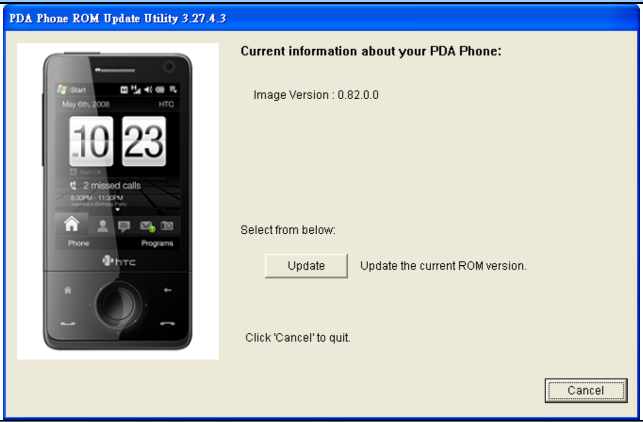
| RUU-1 | |
|---|---|
| 7. Hold the volume down key then press power button to trigger the boot loader mode.<br>8. Read the pop-up message form ROM update utility and select the "I understand…" checkbox.<br>9. Click "Next" to proceed. |  |



| RUU-2 | |
|---|---|
| 10. Read the pop-up message form ROM update utility to follow and perform the instructions and select the "I completed…" checkbox.<br>11. Click "Next" to proceed. |  |

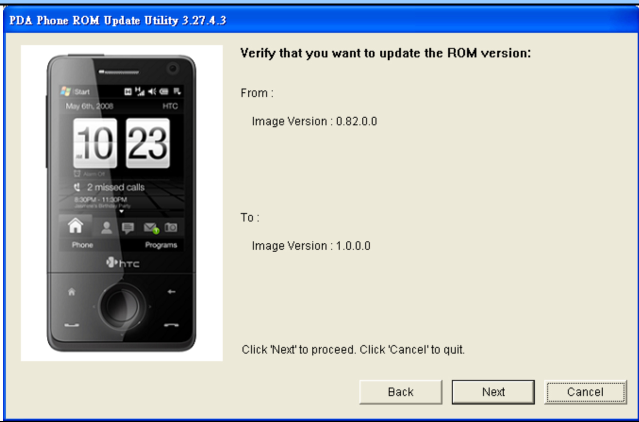
**RUU – 3**

12. Current image version confirmation.
13. Click “Update” to proceed



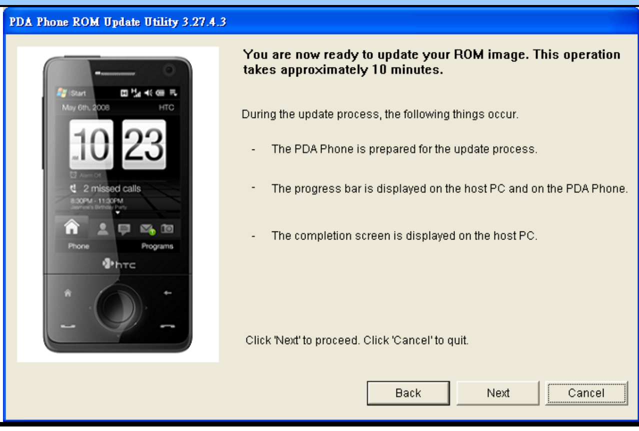

**RUU-4**

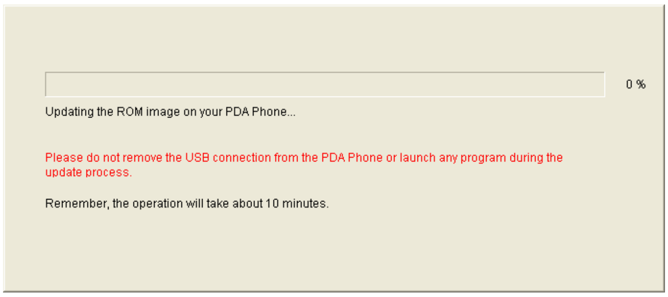
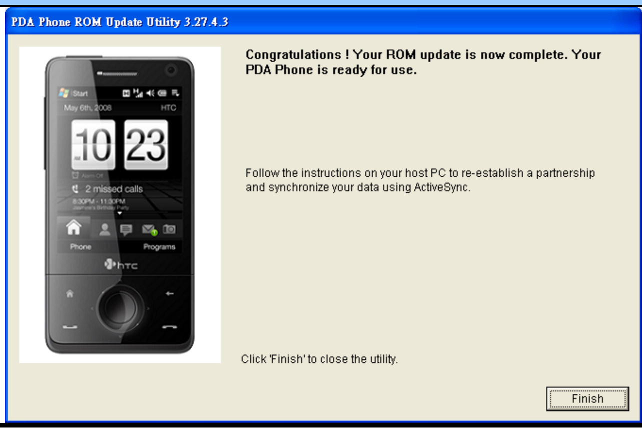
14. Double verify the ROM revision which you want to update before re-flash procedure.
15. Click “Next” to proceed.



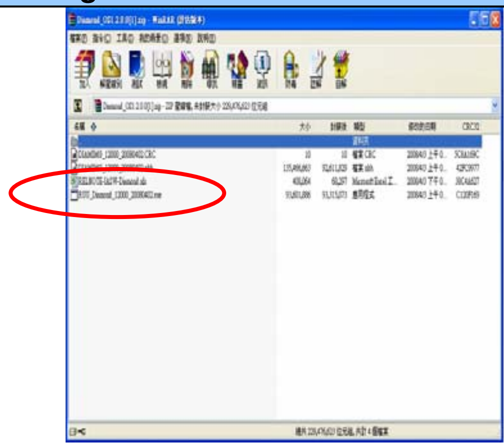

**RUU-5**

16. Read the information from pop-up message and the OS update procedure will takes 10 minutes long.
17. Click “Next” to proceed.



| RUU – 6 | |
|---|---|
| 18. You can see the update progress from your PC and in your device. |  |
| **RUU – 7** | |
| 19. The OS upgrade is finished, click "Finish" to close the utility. |  |

## 3.2 ROM Image upgrade thru SD card

| **Download OS Image from SDO** | |
|---|---|
| 1. Download OS image from SDO. [http://htcscm10.htc.com.tw/SDO](http://htcscm10.htc.com.tw/SDO)<br>2. Un-zip the image file. |  |
| **Format SD card and copy image file to SD card** | |
| 3. Select file system and format the SD card to FAT32 mode.<br>4. Copy image file XXX.nbh to the micro SD card and rename to **RAPHIMG.NBH**. |  |

## SD Upgrade - 1

5. Turn the device power off and insert micro SD card.
6. Press and hold **Volume down** + **Power** button and then release the power button first to enter Boot loader mode.
7. Press **Power** button to start upgrade procedure.




## SD Upgrade - 2

8. Reading source code from micro SD card.

[Note]: Please don't power off the device during this process.




## SD Upgrade - 3

9. After finish, press Reset button to reboot.



# 4. DIAGNOSTIC PROGRAM

## 4.1 List of Diagnostic Test Items

| Mode | No | Item | Description | Remark |
|---|---|---|---|---|
| | Function Test | | | |
| Diagnostic | 1 | Auto | Auto Regular Tests (Display, B.L, Vibrator, etc…) | |
| | 2 | ROM Checksum Test | ROM size | |
| | 3 | Stylus Detect Test | Stylus remove and insert | |
| | 4 | LED Test | Backlight of Navi board module | |
| | 5 | Display Test | Color bar/R/G/B/Black/White/Gray pattern. | |
| | 6 | Back Light Test | LCD back light test (dim to bright). | |
| | 7 | Vibrator Test | Vibrator on test. | |
| | 8 | Sliding Test | QWERTY keyboard sliding test | |
| | 9 | SD card R/W Test | SD card read / write test | |
| | 10 | Key Test | Power, Volume up, Volume down, Key action, Key left, Key up, Key right, Key down | |
| | 11 | QWERTY key Test | QWERTY keyboard test | |
| | 12 | Get Radio version | Get Radio version test | |
| | 13 | G Sensor Test | Motion G sensor function test | |
| | 14 | Touch Panel Test | Touch Panel test | |
| | 15 | SDRAM test | SDRAM read / write test | |
| | Run-in Test | | | |
| | 1 | 1 Hour | 1 Hour Run-in Test/Press Soft1 key. | Option |
| | 2 | 2 Hours | 2 Hours Run-in Test/Press Soft 2 key. | Option |
| | 3 | 4 Hours | 4 Hours Run-in Test/Press Start key. | Option |
| | 4 | 8 Hours | 8 Hours Run-in Test/Press OK key. | Option |
| | Format Internal Storage (Personal information, talk times) | | | |
| | Device Info | | | |

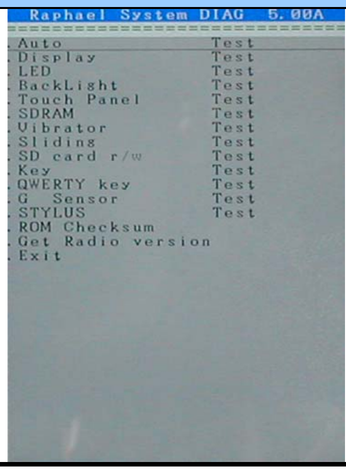
| Mode | No | Item | Description | Remark |
|---|---|---|---|---|
| Win CE | 1 | Bluetooth Test | Bluetooth Function Test | |
| | 2 | USB Test | USB link test (Microsoft ActiveSync) | |
| | 3 | Camera Test | Camera Function Test | |
| | 4 | WLAN Test | WLAN Function Test | |
| | 5 | GPS Test | GPS Function Test | |
| | 6 | FM Radio | FM Radio Function Test | |
| | 7 | Audio Test | All Audio Function Test | |
| | 8 | Cap Sensor Test | Navi Cap Sensor Function Test | |

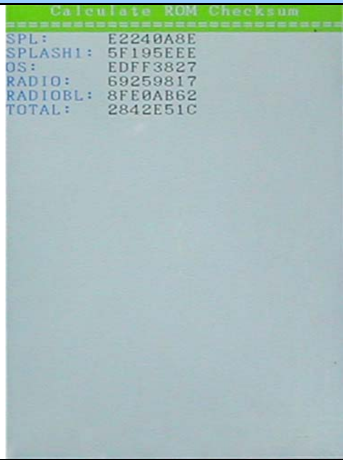
### Test Procedure

How to select test item: Using navigation button -"Up" or "Down" to select the test items

How to execute the test program: Press "Action" button to start each of test items.

### Diagnostic

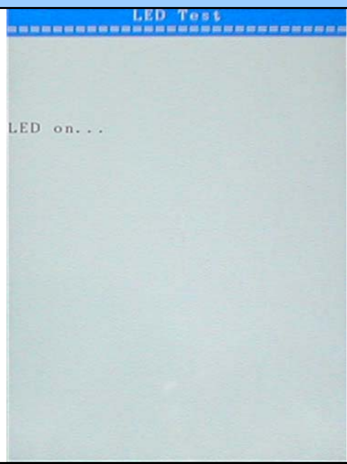
| **Main Menu/Function Test Menu** | |
|---|---|
| 1. Turn the device power off and insert Diagnostic SD card.<br>2. Press and hold **Volume down** + **Power** button and then release the **Power** button to enter Diagnostic mode.<br>3. Using to select the test item and move to next page as well.<br>4. Select item "Function Test" to find the Function test menu. |  |
| **Auto Test** | |
| 5. Press the Action key to start the Auto-test.<br>6. It will perform the regular tests, please follow the system instruction to do the test. |  |

| **ROM Checksum Test** | |
|---|---|
| 7. Press Action key to select<br>8. The Rom Checksum will be displayed on the screen |  |



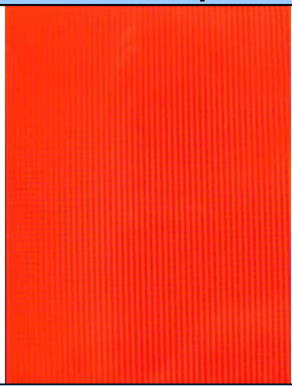
| **Stylus Detect Test** | |
|---|---|
| 9. Press Action key to select<br>10. It will perform the stylus test, please follow the system instruction to remove and insert the stylus. |  |



| **LED Test** | |
|---|---|
| 11. Press Action key to select<br>12. It will perform the LED test, please follow the system instruction to check the LED. |  |

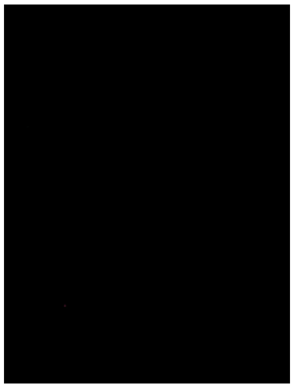
## Display Test (and RED/ GREEN pattern)

13. Press Action key to select Display Test on Function test menu.
14. After the test pattern is show up, please check the pattern if any un-uniform color or chromatist.
15. Press Action key to continue the next test pattern.




## Display Test (BLUE/ BLACK pattern)

16. Press Action key to continue the next test pattern.

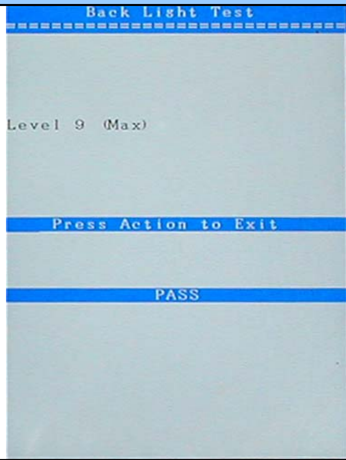
## Display Test (WHITE/Color bar pattern)

17. Press Action key to continue the next test pattern.



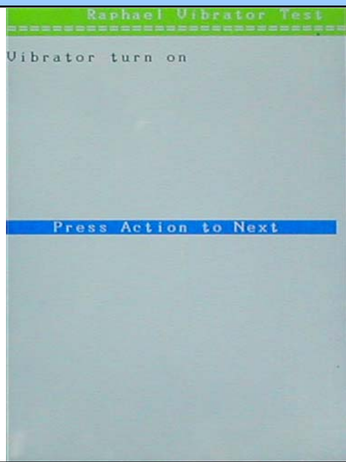

## LCD Back Light Test

18. Press Action key to select B.L Test on Function test menu.
19. Press Action key to switch the LCD backlight level from Level 1,Level2, Level3, Level4, Level5 Press Action key to exit and return to Function test menu.



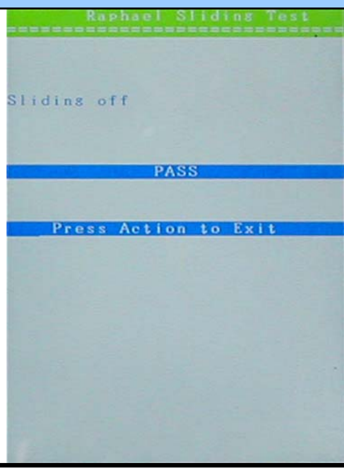

## Vibrator Test

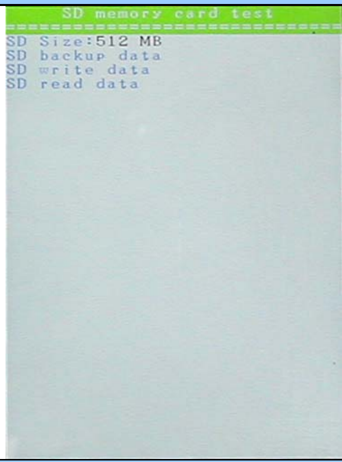
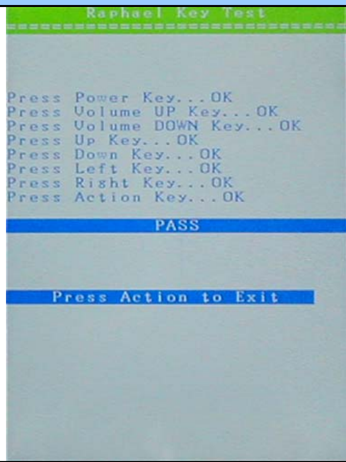
20. Press Action key to select Vibrator Test on Function test menu.
21. Press Action key to exit and return to Function test menu.

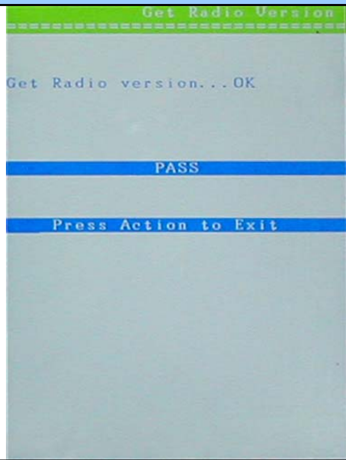
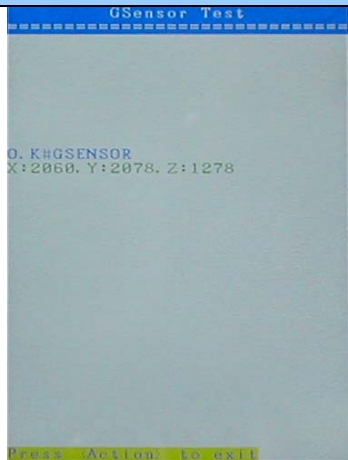
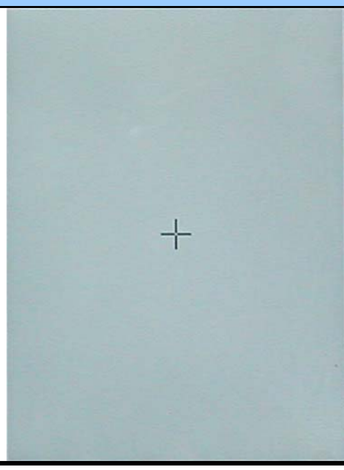


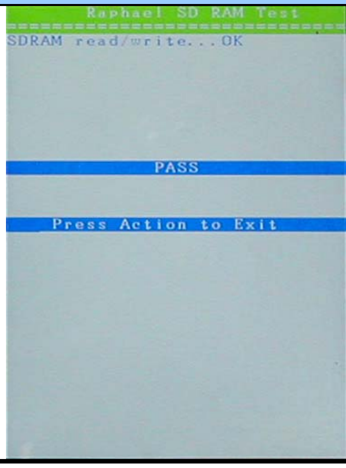

## Sliding Test

22. Press Action key to select Sliding Test on Function test menu.
23. Press Action key to exit and return to Function test menu.



| **SD card R/W Test** | |
|---|---|
| 24. Press Action key to select <u>SD card R/W Test</u> on Function test menu. |  |
| **Key Test** | |
| 25. Press Action key to select <u>Button Test</u> on Function test menu.<br>26. Follow the instruction on screen to perform the Key/Button test **<u>(Power, Volume up, Volume down, Key action, Key left, Key up, Key right, Key down)</u>**.<br>The screen will return to Function test menu after the test is finished. |  |
| **QWERTY Key Test** | |
| 27. Press Action key to select <u>QWERTY key Test</u> on Function test menu. |  |

| **Get Radio Version** | |
|---|---|
| 28. Press Action key to select <u>Get Radio version</u> on Function test menu.<br>29. Press Action key to exit and return to Function test menu. |  |
| **G Sensor Test** | |
| 30. Press Action key to select <u>G Sensor Test</u> on Function test menu.<br>31. Put the unit on a horizontal and flat table when perform this test. |  |
| **Touch Panel Test** | |
| 32. Press Action key to select <u>Get Radio version</u> on Function test menu. |  |

| **SDRAM Test** | |
|---|---|
| 33. Press Action key to select <u>Get Radio version</u> on Function test menu.<br>34. Press Action key to exit and return to Function test menu. |  |

## WinCE Test

### Bluetooth Test - 1

1. Tap icon Comm Manager on the Today screen and turn on Bluetooth.
2. Tap the icon "Settings" down-right the corner of the screen and select the "Make this device…." Checkbox.
3. Press Action key (Jog-ball) to go next test pattern.



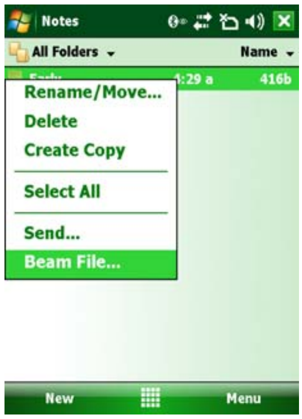




### Bluetooth Test-2

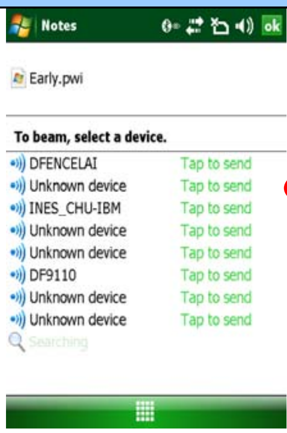
4. Tap Start->Settings->Connections->Beam and select "Receive all…." Checkbox.
5. To create a file, tap Start->Programs ->Notes->New
6. Tap and select the "Beam file…"




### Bluetooth Test-3

7. Once device is searched, tap the device to send the file.
8. Return to Today screen and tap Start->Program->Comm Manager ->Bluetooth to turn off Bluetooth.






## USB Test

1. Start up the Microsoft® ActiveSync®program in the PC.
2. Select ActiveSync in the setting of menu
3. Insert USB cable and connect unit to desktop/ or laptop.
4. The USB to PC icon -> is appears on the Today screen when your device is connected to your desktop/ or laptop.







## Camera Test

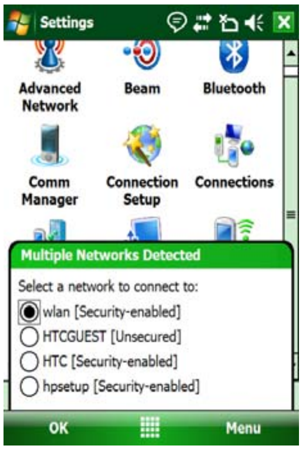
1. Tap Start->Program->Camera or Press Camera button to turn on the Camera.
2. Make sure the device will present and enter the preview display.
3. Check camera pre-view and image quality.






## WLAN Test

1. Tap icon Comm Manager on the Today screen and turn on WLAN.
2. Select the hot-spot/ or access point which searchable and appears on screen.
3. Once the hot-spot (access point) is connected, press the IE button and logon Internet.

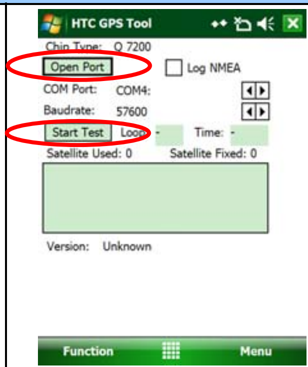


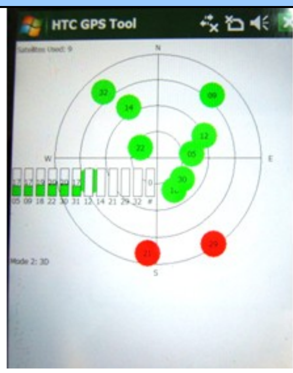




## GPS Test

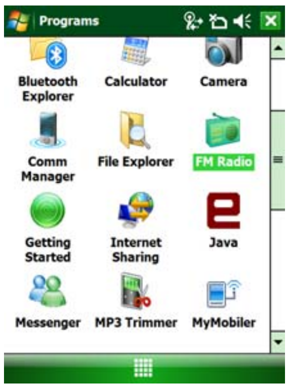
1. Download test program from SDO (DOC-00042190) http://htcscm10.htc.com.tw/SDO
2. Setup the COM port to COM4.
3. Place device in GPS receptor coverage area and tap the icon "Open GPS".
4. Check the GPS status as picture shown.

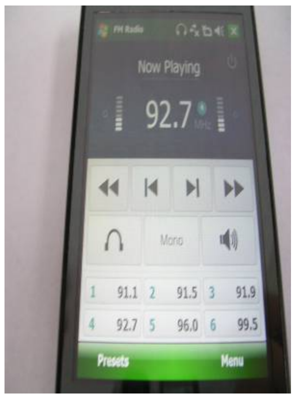


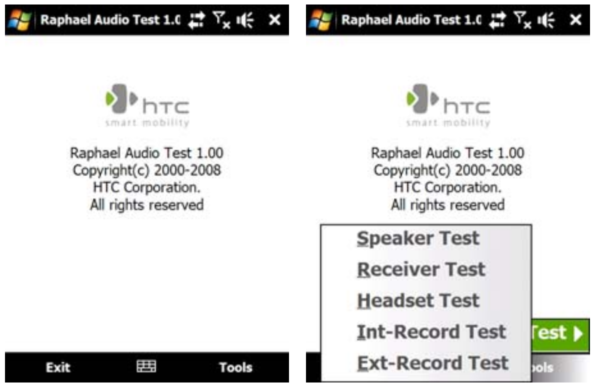

## FM Radio Test

1. Insert the headset into the USB connector before doing the testing.
2. Tap icon FM Radio in the programs of the menu.
3. Select the different channels for testing.

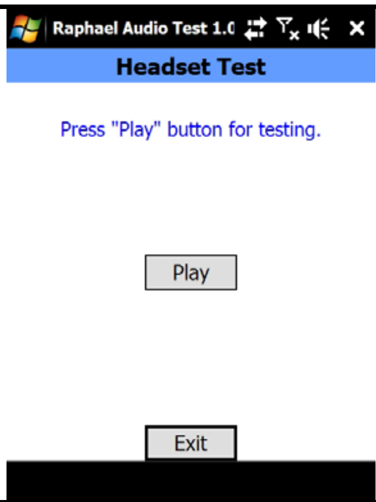



## Audio Test-1

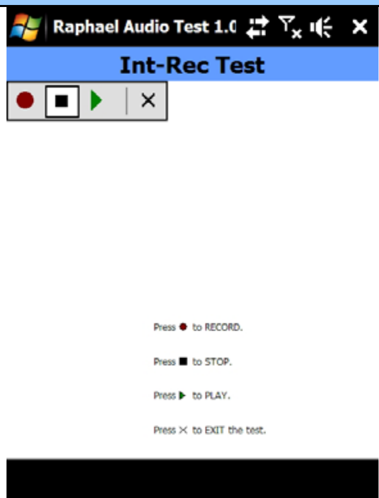
| | |
|---|---|
| 1. Download test program from SDO (DOC-00043599) [http://htcscm10.htc.com.tw/SDO](http://htcscm10.htc.com.tw/SDO)<br>2. Un-zip the image file.<br>3. Copy “mfgtest.dll” and “Audio Test.exe” to internal storage.<br>4. Execute ”Audio Test” program from internal storage.<br>5. Choose the each test in the menu of “Tools” |  |
| **Audio Test-2** | |
| 6. Select the Speaker Test then press Play button for testing |  |
| **Audio Test-3** | |
| 7. Select the Receiver Test then press Play button for testing |  |
| **Audio Test-4** | |

8. Connect the headset into the USB port before doing the testing
9. Select the Headset Test then press Play button for testing




## Audio Test-5

10. Select the Int-Rec Test then press the “Record” button for voice recording first
11. Stop the voice record then press “Play” button for internal receiver test



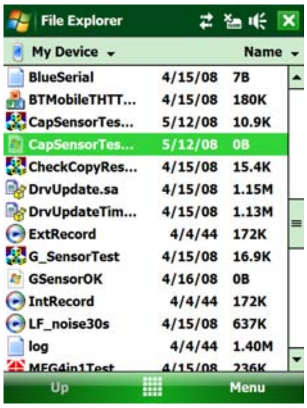

## Audio Test-6

12. Connect the headset into the USB port before doing the testing
13. Select the Ext-Rec Test then press the “Record” button for voice recording first



## Cap Sensor Test-1

1. Install CapSensorTest tool to device.
2. Execute the test tool.







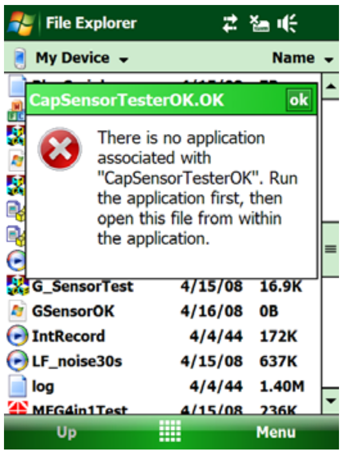
## Cap Sensor Test-2

3. Gently touch the surface of the keycap.
4. The program will exit automatically once the function is normal.



## Cap Sensor Test-3

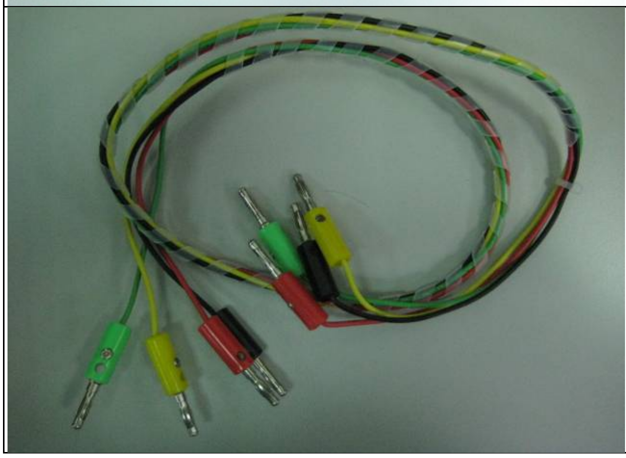
5. Find the “CapSensorTestOK” log file in the My Device folder and it means cap sensor function pass.

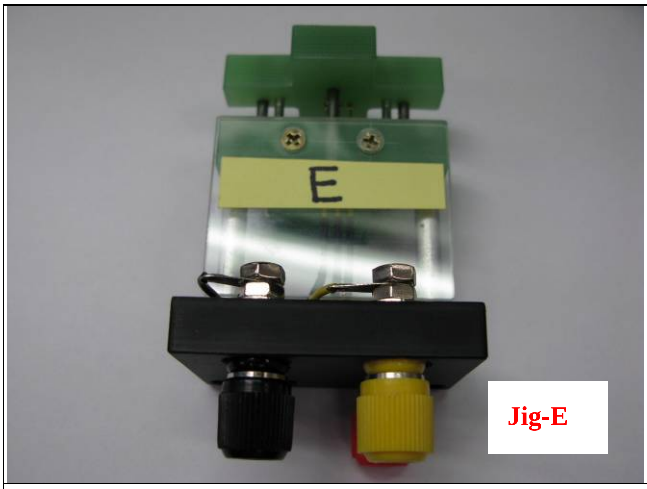


# 5. Power measurement test

## 5.1 Main board leakage current Test Procedure

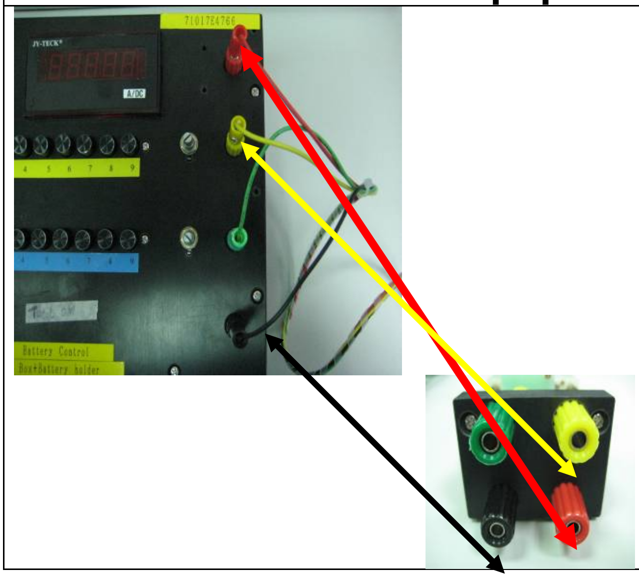
This is a quick method to measure if any abnormal leakage current on main board which caused high power consumption compare to GOOD main board.

| **Equipment list** | |
|---|---|
|   | **1. Control box** |
|  | **2. 4 colors cable**<br>Cable A: Red<br>Cable B: Yellow<br>Cable C: Green<br>Cable D: Black |




**C. types Jig**
Jig - E (3 pins-Short)

## Equipment set up



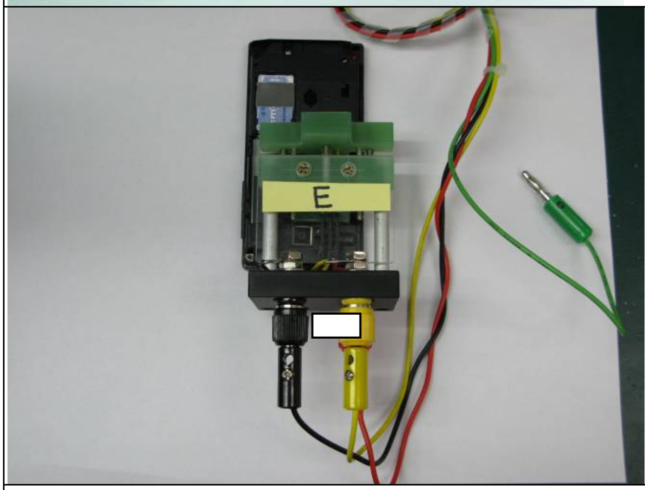
1. Connect control box and jig through
   3 colors cable with red, black and yellow




**2. Set up each button by row A~D according to product specification Following is an setting for Diamond**

| MODEL | JIG TYPE | Button set up matrix | | | |
|---|---|---|---|---|---|
| | | A | B | C | D |
| Raphael | E | 0 | 8 | X | 0 |

**It means, press button A0,B8,D0**

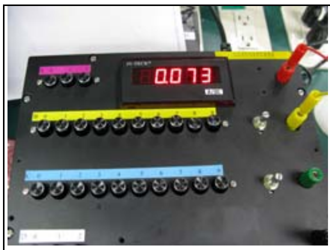
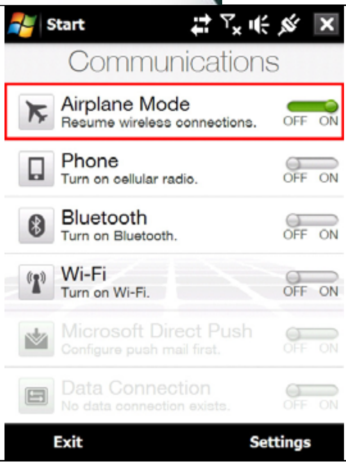



**3. Install jig to device (the photo is for reference only)**

## Start testing




1. Turn on control box power button

| | |
|---|---|
|   | 2. Press Power button to turn on the Device |
|   | 3. In "main page", Check phone status, Click "Turn on Airplane mode"<br>Set the unit to :<br>* Airplane mode<br>* Make sure all RF function is off (phone, BT, Wifi..) |
| Sleep current test | 4. Switch OFF the unit. Unit is turn off and no display. Sleep current value must under 3mA, condition: Display&BL off/RF off/BT off/WiFi off, if over the criteria, it means M/B failed, please replace M/B for repair. |
| Idle current test | 5. Measure Idle mode current. Idle current value must under 82mA, condition: Display on / BL default / KB LED off / GSM standby / WiFi off / BT off, if over the criteria, it means M/B failed, please replace M/B for repair. |

Conclusion:

**If current consumption is passed at both of idle and sleep mode, it means M/B is GOOD. If there is any item FAILED at idle or sleep mode, it means M/B is failed, please replace M/B for repair.**

## 5.2 Battery rundown test procedure

**Test Requirement:**

-Windows 2000/XP

-USB Cable

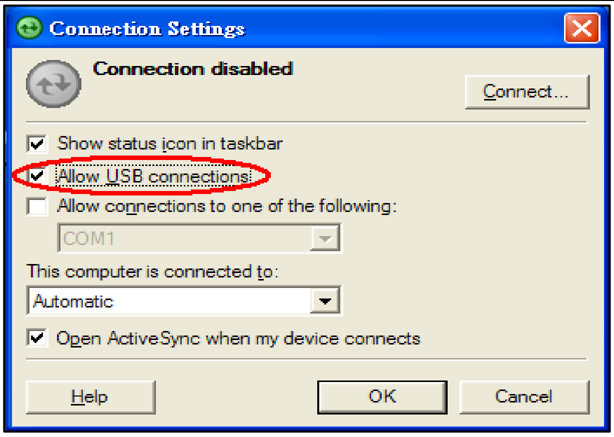
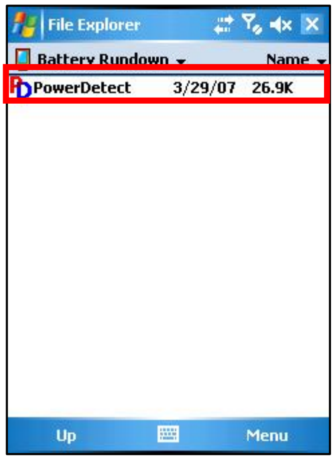
-ActiveSync 4.2 above (WINCE 6.0 should use ActiveSync 4.5)

-Master Unit

-Battery in Warrantee

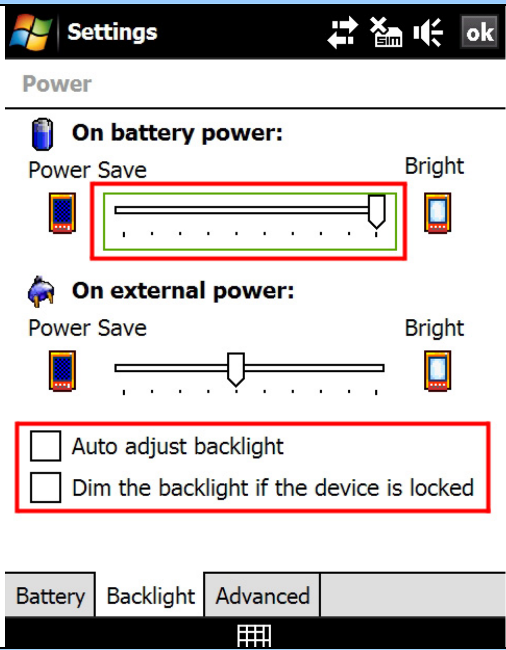
**Caution: Please charge your unit to full capacity for battery (until the green light is displayed) before doing the test.**

**TEST PROCEDURE**

| **Connect device to PC** | |
|---|---|
| I. Setting and allow USB connections in Microsoft ActiveSync.<br>II. Connect your device and desktop/ or laptop via USB cable.<br>III. Check the pop-up message from Microsoft ActiveSync when device is synchronized with PC. |  |
| **Copy the Battery Rundown tool into the device** | |
| IV. Make a folder in the device.<br>V. Copy PowerDetect.exe into the folder. |  |

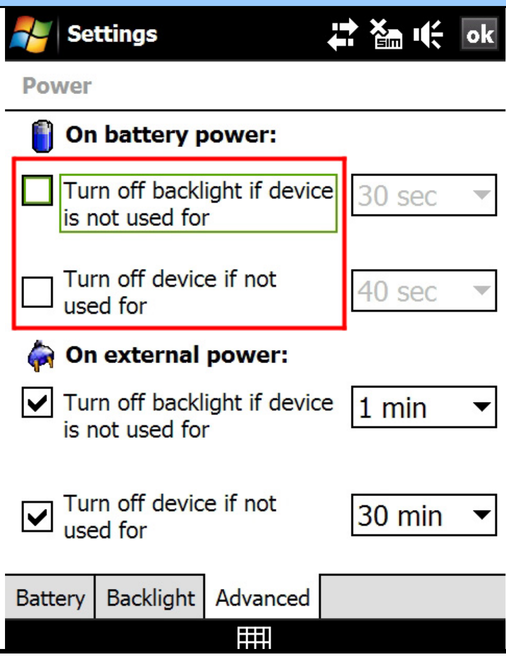
**Battery Rundown-1**

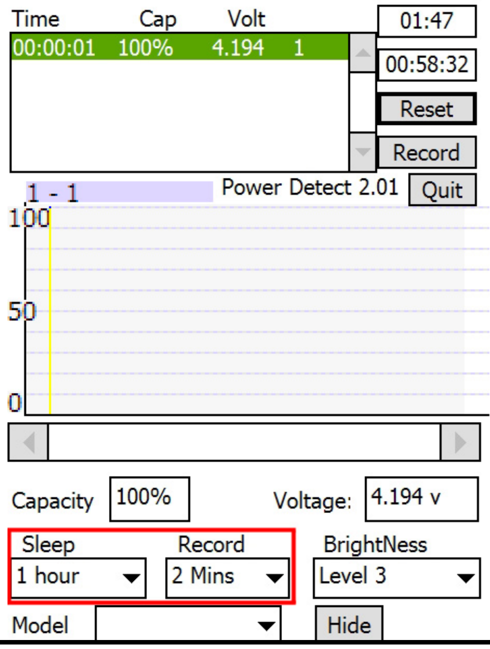
VI. Adjust the Backlight brightness into the maximum level on battery power. (Disable auto adjust backlight and dim the backlight if the device is locked)




**Battery Rundown-2**

VII. Disable Turn off backlight if device is not used for and Turn off device if not used for on Advanced menu.



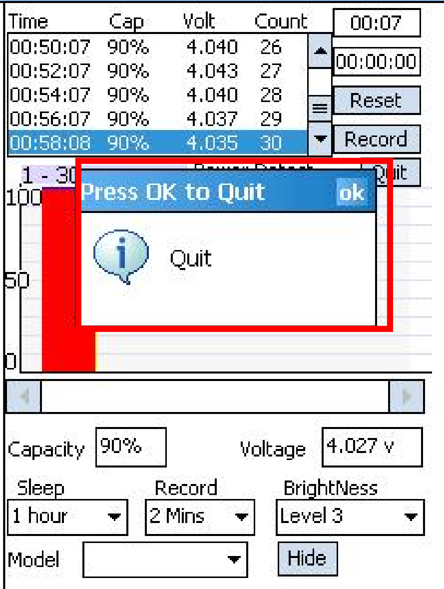
| **Battery Rundown-3** | |
|---|---|
| VIII. Execute PowerDetect.exe under WinCE |   |
| **Battery Rundown-3** | |
| IX. Set the Sleep as 1hour<br>X. Set the Record as 2Mins |   |

## Battery Rundown-4

XI. After running 1 hour, the test will be finished.

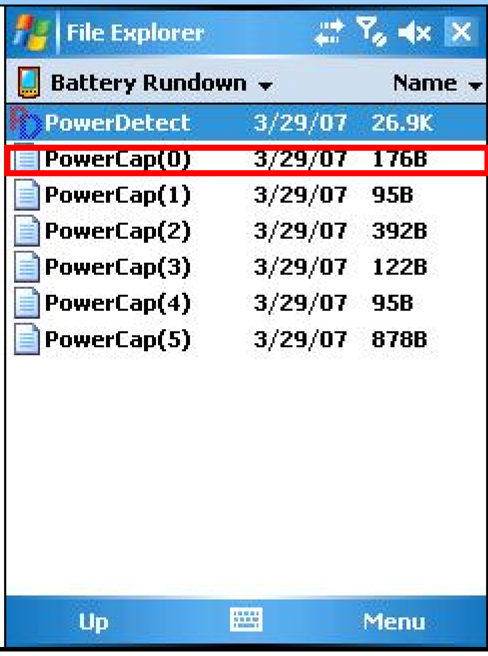
XII. Press the Power Button to turn on the power.

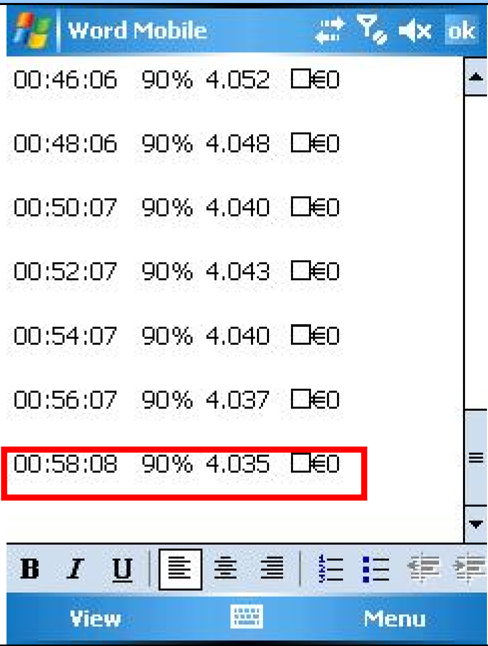
XIII. Click ok to quit the program.




## Battery Rundown-5

XIV. Test result is generated into the log file as PowerCap(x).



| **Battery Rundown-6** | |
|---|---|
| XV. Tag the log file to check the capacity. |  |



**Caution: If the capacity is under 70%,**
**Please replace a new battery.**

# 6. Cosmetic Inspection Criteria

## 6.1 Classes definition of inspective area

- Class A area => The front side of main unit involve all buttons except LCD.
- Class B area => View of QWERTY keyboard (involve stylus).
- Class C area => 4 sides and back views of main unit.
- Class D area => The socket of battery, inner side of battery cover.

Photo of inspection areas

| | |
|---|---|
| **CLASS A** |  |
| **CLASS B** |  |

| | |
|---|---|
| **CLASS C** |   |

| | |
|---|---|
| |   |
| **CLASS D** |   |

**IT IS GENERIC COSMETIC INSPECTION CRITERIA FOR ALL PRODUCTS IF THERE HAVE ANY CONFLICT WITH THESE GENERIC CRITERIONS; PLEASE FOLLOW THE PRODUCT INSPECTION CRITERIA RESPECTIVELY.**

Description

- **D**: Diameter / **L**: Length / **W**: Width / **N**: Number of defects/ **S**: Distance from dot to dot
- Inspecting distance: 30 ± 5cm / Mechanical inspection angle：90 degrees /
- LCM inspection angle：90±15 degrees / Inspection time:5 secs per surface.
- Ambient illumination is to be 500-1100 lux
- The inspection condition of Newton ring:

  a. Inspection distance: 30cm / Inspection time: 5 sec
  b. Ambient illumination is to be 500-1000 Lux (Incandescent lamp)
  c. Inspection should be performed under the condition that LCD screen could reflect the mirror image of lamp.
  d. The criteria of Newton ring's tinges and measure of area must follow up the worst-case sample.

## 6.2 Display inspection

| Inspection Defects | | | Accept Level | Level |
|---|---|---|---|---|
| Electrical Characteristic Defects | Bright Dots | Single | Red+ Green+ Blue ≦ 3, S ≥ 5mm. | Minor |
| | | 2 adjacent | 0 | Minor |
| | | 3 or more adjacent | 0 | Minor |
| | Dark Dots | Single | Total Number ≦ 2, S ≥ 5mm. | Minor |
| | | 2 adjacent | 0 | Minor |
| | Dark or Bright lines | | 0 | Minor |
| | All Allowable Dots Defects | | Total Number ≦ 3, S ≥ 5mm. | Minor |
| | Shift and tilt of screen viewed area | | The black edge around display area must be detected by front view. | Minor |
| Foreign Scratch, Objects or Lint on power off status | Scratch | | 0.03 < W ≦ 0.1 (mm)<br>L ≦ 5 (mm), N ≦ 2 (mm) | Minor |
| | Lint (linear foreign objects) | | 0.03 < W ≦ 0.1 (mm)<br>0.3 < L ≦ 3.0 (mm)<br>N ≦ 5 | Minor |
| | Spots | | 0.1 < D ≦ 0.3 (mm), N ≦ 4 | Minor |
| | Fish eye on film | | 0.1 < D ≦ 0.4 (mm), N ≦ 4 | Minor |
| | Breakage on film surface | | Not acceptable | Minor |
| | Total acceptable defect quantity ≦ 10 | | | Minor |

## 6.3 Main unit inspection

### Cosmetic inspection generic spec :

1. Exposure of substratum is not acceptable for peeling. (Area 4 is included)If not exposure of substratum, please check by SPEC of dot or scratch. (Area 4 is not included)
2. Logo may not have blurred or double print., the peeling on logo is not acceptable.
3. The character printing of main unit does not allow bad printing, scratch, dirty, lacquered peeling, dark/white dot on it)
4 .Camera Lens: Contamination dot / foreign matter
D≦0.25mm, S≧3mm；Lint: L≦1.5mm , W≦0.2mm。
5. Accessories include Cradle; please follow Class B for inspection.
6. Main unit cosmetic inspection criteria of class D, please follow dummy class C for inspection criteria.

**GAP & STEP INSPECTIONS**

| Description | Accept criteria | Level |
|---|---|---|
| Status of main unit assembly | Defective assembly and deformed shape were not allowed | Minor |
| Gap between upper / lower slide part | Gap between upper / lower slide part < 0.7mm | Minor |
| QWERTY key gap and around gap | Gap between keypad and C part < 0.35mm | Minor |
| Touch window and Navi key gap | Gap between touch window and Navi key < 0.3mm | Minor |
| Gap around power button, record button, volume key, PTT button | Key stuck are not allowed | Minor |
| Stylus | Stylus assembly protruding, loose, missing, falling and deformed are not allowed | Minor |
| Gap between battery cover and main unit | Gap between D and E part < 0.3mm | Minor |
| Gap between touch window and A part | Gap between touch window and A part < 0.3mm | Minor |
| Gap between navi and A part | Gap between navi and A part < 0.3mm | Minor |
| Gap between touch window and navi key | Gap between touch window and navi key < 0.3mm | Minor |
| Step between upper / lower slide part | Step < 1.0mm | Minor |
| Others between upper / lower parts | Step < 0.40mm | Minor |
| Step between touch window and Navi key | Step between touch window and Navi key < 0.3mm (Navi should higher than touch window) | Minor |
| Step between bezel and Navi key | Step between bezel and Navi key < 0.25mm (Navi should higher than bezel) | Minor |

**COSMETIC INSPECTION:**

## Scratch

| Description | Accept criteria | |
|---|---|---|
| Class A | Exposure of substrate do not accept<br>Scratch : L≦4mm ,W≦0.2mm ,N≦2, S≧10mm | **MI** |
| Class B | Exposure of substrate do not accept<br>Scratch : L≦7mm ,W≦0.25mm ,N≦3, S≧10mm<br>If IR window has scratch without any effective feeling then don't care<br>IR window scratch: L≦3mm,W≦0.2mm,N≦3 | **MI** |
| Class C | Label area don't care<br>Exposure of substrate do not accept<br>Scratch : L≦10mm ,W≦0.4mm ,N≦5, S≧5mm | **MI** |

## Contamination dot/Granule dot/Cave granule

| Description | Accept criteria | |
|---|---|---|
| Class A | D≦0.5mm ,N≦2,S ≧15 mm<br>Ignored if D D≦ 0.15mm | **MI** |
| Class B | Total: D<0.6mm ,N≦4,S ≧15 mm<br>Ignored if D D≦ 0.25mm | **MI** |
| Class C | D<0.9mm ,N≦4,S ≧10 mm | **MI** |

## Burr….etc.

| Description | Accept criteria | |
|---|---|---|
| Burr. | Don't accept hand scrape | **MI** |

## Imprint mark

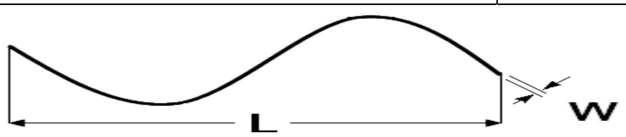
| Description | Accept criteria | |
|---|---|---|
| Class A | 0.25≦diameter≦0.65mm ,N≦3 | **MI** |
| Class B | 0.65mm<Diameter≦1.00mm,N≦3 | **MI** |

## Bright mark

| Description | Accept criteria | |
|---|---|---|
| Class A | L≦2.5mm,W≦0.25mm,N≦3 | **MI** |
| Class B | L≦3.0mm,W≦0.25mm,N≦4 | **MI** |
| Class C | L≦3.0mm,W≦0.3mm,N≦5 | **MI** |

## Lint

| Description | Accept criteria | |
|---|---|---|
| Class A | L≦3mm , W≦0.2mm ,N≦2, S ≧5 mm | **MI** |
| Class B | L≦5mm , W≦0.3mm ,N≦3, S ≧5 mm | **MI** |
| Class C | L≦10mm , W≦0.3 mm ,N≦3 | **MI** |




This definition is not applicable to LCM.

# 7. Generic Troubleshooting

## 1 · Main Unit Does Not Respond to Power Button

(1) Connect the AC adapter, maybe the battery pack is exhaust and wait few minutes for battery recharging.

(2) Check if battery installed well.

(3) Check the Power Button whether it's damaged.

(4) Replace another battery pack.

(5) Try to start boot-loader mode [refer to section 4.2]. Re-flash ROM if boot loader mode is enabled.

(6) Check all connectors including LCD FPC to Main Board.

(7) Replace Main Board if necessary.

(8) Once the defective part has been identified, verify the defective part again whether the symptom could be duplicated with another unit.

## 2 · Touch Panel Does Not Respond to Screen Tap

(1) Check the connection of LCM FPC cable whether is properly connected.

(2) Try to cold boot the unit then perform screen tap again.

(3) Try with another LCM.

(4) Try with another Main Board.

(5) Replace LCM if necessary

(6) Replace Main Board if necessary.

(7) Once the defective part has been identified, verify the defective part again whether the symptom could be duplicated with another unit.

## 3 · Buttons Do Not Respond

(1) Try to cold boot the unit then tries again.

(2) Dismantle the unit; check the status of switches on the Main Board and the plastic parts of the Button not responding.

(3) Try with another Main Board or Front Bezel.

(4) Replace Main Board or Front Bezel if necessary.

(5) Once the defective part has been identified, verify the defective part again whether the symptom could be duplicated with another unit.

## 4 · Unusual Vertical / Horizontal lines or partial display

(1) Check the connection of LCM FPC whether is properly connected.
(2) Try to cold boot the unit then tries again.
(3) Try to re-flash the ROM code.
(4) Try with another LCM.
(5) Try with another Main Board.
(6) Replace LCM if necessary
(7) Replace Main Board if necessary.
(8) Once the defective part has been identified, verify it again with the defective part whether the symptom could be duplicated.

## 5 · Back Light Does Not Turn ON/OFF

(1) Check the connection of LCM FPC whether is properly connected.
(2) Try to re-flash the ROM code.
(3) Try with another LCM.
(4) Try with another Main Board.
(5) Replace LCM if necessary
(6) Replace Main Board if necessary.
(7) Once the defective part has been identified, verify it again with the defective part whether the symptom could be duplicated.

## 6 · CF/SD Card cannot be used

(1) Check whether CF/SD Card is fully inserted to the slot until you hear a click.
(2) Try to re-flash the ROM code.
(3) Try with another CF/SD Card.
(4) Try with another Main Board.
(5) Replace Main Board if necessary.
(6) Once the defective part has been identified, verify it again with the defective part whether the symptom could be duplicated.

## 7 · PC Connection not possible

(1) If test result is NFF, it is possible caused by user connect cradle to computer before ActiveSync is installed.

(2) Check whether "Connection Settings" in the MS ActiveSync is properly set.

(3) Check whether it connects with other cables or cradle, customer's cable might be damaged.

(4) Check the external appearance of the connector on the unit whether it is physically damaged.

(5) Try to re-flash the ROM code.

(6) Replace Main Board if necessary.

(7) Once the defective part has been identified, verify it again with the defective part whether the symptom could be duplicated.

## 8 · Battery Pack does not start

(1) Make sure the battery cover is closed properly.

(2) Connect to the AC Adapter and see if it takes charge. Also check AC Adapter condition.

(3) Check whether AC Adapter is functioning properly.

(4) Check whether the condition of Battery Charging status is correct.

(5) Check the appearance of Battery Pack if any abnormal..

(6) Try with another Battery Pack or Replace Battery Pack if necessary

(7) Try with another Main Board or Replace Main Board if necessary.

(8) Once the defective part has been identified, verify it again with the defective part whether the symptom could be duplicated.

## 9 · Battery discharges quickly even after fully charged

(1) Make sure the Battery Pack takes fully charge with AC Adapter.

(2) Check whether the condition of Battery Charging status is correct.

(3) Dismantle the unit and check the appearance of Battery Pack.

(4) Try with another Battery Pack or Replace Battery Pack if necessary

(5) Try with another Main Board or Replace Main Board if necessary.

(6) Once the defective part has been identified, verify it again with the defective part whether the symptom could be duplicated.

## 10 · Battery Pack does not recharge

(1) Make sure the Battery Pack takes fully charge with AC Adapter.

(2) Check whether the condition of Battery Charging status is correct. Charge should be done no more than 4 hours.

(3) Dismantle the unit and check the appearance of Battery Pack.

(4) Try with another Battery Pack or Replace Battery Pack if necessary

(5) Try with another Main Board or Replace Main Board if necessary.

(6) Once the defective part has been identified, verify it again with the defective part whether the symptom could be duplicated.

## 11 · No Sound from Speaker or Distorted sound

(1) Check "Sound & Notifications" Settings in the unit for Sound Enabling.

(2) Make sure it's not MUTED.

(3) Try to re-flash the ROM code.

(4) Clean up the speaker connection side on MB if there is any contamination.

(5) Dismantle and Check whether the Speaker is properly installed (Orientation)

(6) Replace Speaker if necessary.

(7) Replace Main Board if necessary.

(8) Once the defective part has been identified, verify it again with the defective part whether the symptom could be duplicated.

## 12 · No Recorded Sound or Distorted sound

(1) Check "Sound & Notifications" Settings in the unit for Sound Enabling.

(2) Make sure it's not MUTED.

(3) Try to re-flash the ROM code.

(4) Dismantle and Check whether the Microphone is properly installed.

(5) Replace Microphone if necessary.

(6) Replace Main Board if necessary.

(7) Once the defective part has been identified, verify the defective part again whether the symptom could be duplicated with another unit.

## 13 · Wireless connection (WLAN/BT) not functioning

(1) Make sure the wireless environment is OK before connecting to WLAN.

(2) Make sure the wireless connection setting has properly set.

(3) Make a life connection with Internet or another device.

(4) Try to re-flash the ROM code.

(5) Try with another main board if necessary

(6) Once the defective part has been identified, verify the defective part again whether the symptom could be duplicated with another unit.

# 8. Generic Labeling Plan

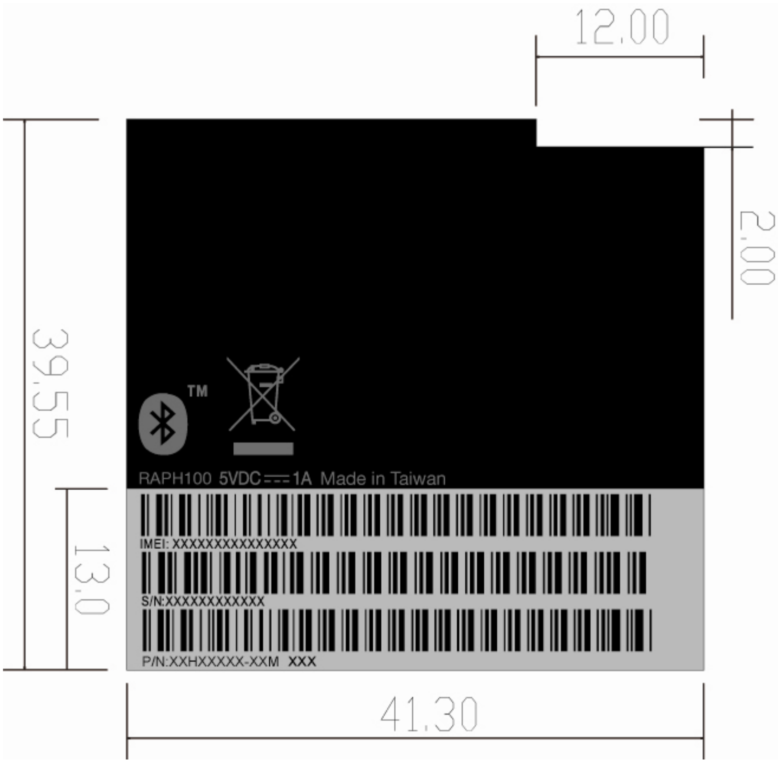
## ■ Main unit

### ■ *Agency label_RAPH100*

The brand name is shown on bezel

HTC P/N: 77H00623-00M

Size: 40.3X 38.55mm



- ***Water sensitive label***

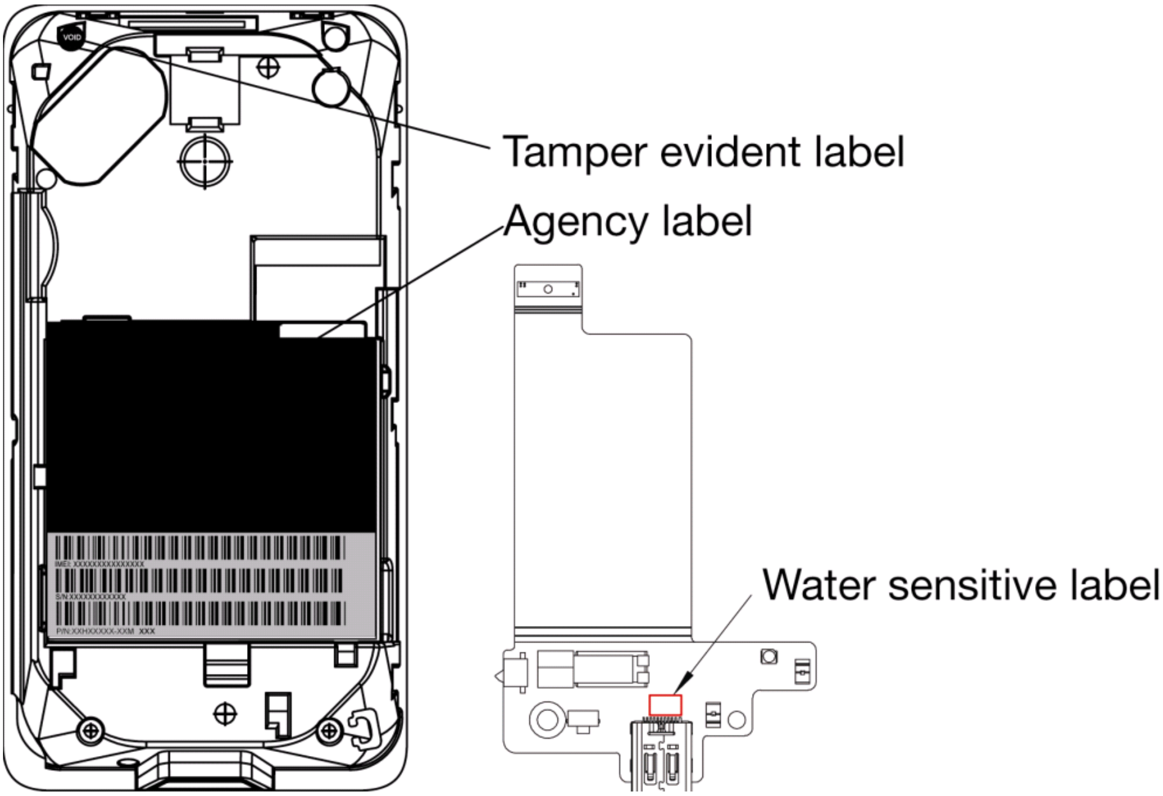
  HTC P/N: 77H00668-00M

  Qty: 1

- ***Tamper evident label***

  HTC P/N: 77H00460-01M

  Qty: 1



# 9. Generic Spare Part List and Photos

## 9.1 SPL for Repair

| No | P/N | Description | Qty |
|---|---|---|---|
| 1 | 77H00460-01M | Tamper-Evident Label,VOID wording,black background,3*3mm,MING JYE | 1 |
| 2 | 77H00623-00M | Regulation Label,41.3*39.55mm,MING JYE,RAPH100,Raphael | 1 |
| 3 | 35H00111-08M | BATTERY_LI-ION,1340mAh,3.7V,w/ Mylar,MAXELL,TWS,DIAM171,HA070601,50degC,42.25*40*8mm,RAPHAEL | 1 |
| 4 | 36H00694-00M | Receiver,KDIC,MPR061501DB,15*6*2.7mm | 1 |
| 5 | 36H00717-00M | Speaker,MPS101709BB,KDIC | 1 |
| 6 | 51H10078-02M | Rigid-Flex Board ASSY,IO-BD,900/2100 ,Raphael | 1 |
| 7 | 51H40450-01M | PCBA-MAIN BOARD with SKU_ID,900/2100,Raphael | 1 |
| 8 | 54H00279-00M | Camera Module,PREMIER,CMHT-3A403D,AF,TDK,LARGAN,相互,Micron MI-3130,3.1Mpixel,Micron,19.2*8.9*6.3mm,Raphael | 1 |
| 9 | 71H02564-00M | Damper,left,upper,Hinge,pom,Raphael | 1 |
| 10 | 72H01893-00M | Screw,FPHM1.4-0.3*3.3(2.45,0.3),AISI-1018,BLACK | 2 |
| 11 | 72H02450-00M | Screw,M1.4*L1.8(D2.4,H0.25) | 7 |
| 12 | 72H02474-00M | Screw,M1.4-L4.3-D2.6 | 4 |
| 13 | 72H02689-00M | Screw,M1.4*L2.0(D3.0,H0.25) | 4 |
| 14 | 72H02703-00M | Conductive Fabric,Co-axial cable,Raphael | 1 |
| 15 | 72H02749-00M | Conductive Fabric,LCD,FPC,Hermann | 1 |
| 16 | 72H02756-00M | EMI Gasket,Navi-board,Raphael | 1 |
| 17 | 72H02815-00M | EMI Gasket,Gasket for Hinge,3.5*4*2mm,Raphael | 1 |
| 18 | 72H02816-00M | EMI Gasket,Gasket for Hinge(Navi board),16.13*21.28*0.06mm,Raphael | 1 |
| 19 | 72H02819-00M | EMI Gasket,the Gasket between MB and C parts,8*5*0.06mm,Raphael | 1 |
| 20 | 72H02843-00M | EMI Gasket,MPCB for Main Camera,Hermann | 1 |
| 21 | 72H02844-00M | EMI Gasket,Main Camera,Hermann | 1 |
| 22 | 72H02845-00M | EMI Gasket,MicroSD Connector,Hermann | 1 |
| 23 | 72H02854-00M | Conductive Fabric,Main-FPC_upper,Raphael | 1 |
| 24 | 72H02855-00M | Conductive Fabric,Main-FPC-lower,Raphael | 1 |
| 25 | 72H02863-00M | Damper,left,down,Hinge,Metal,Raphael | 1 |
| 26 | 72H02865-00M | Screw,M1.4*2.2,Hinge | 6 |
| 27 | 72H02886-00M | Screw,SKT-M14025BZNY,M1.4*2.4,Main PCB | 1 |
| 28 | 73H00282-00M | Cable,MURATA,MXHP34HP0900,coaxial, Raphael | 1 |
| 29 | 73H20145-09M | FPC Pre-Assy,SIM FPC,CAREER,Raphael | 1 |
| 30 | 74H01285-00M | Light-sensor-lens-assy,Raphael | 1 |

| | | | |
|---|---|---|---|
| 31 | 76H02314-00M | Rubber,Silicon,Mic,Raphael | 1 |
| 32 | 76H02625-00M | Mylar,Main PCB,Raphael | 1 |
| 33 | 76H02770-00M | Mylar,IO-BD_connector,Raphael | 2 |
| 34 | 76H02823-00M | Tape,For LCD gasket. on navi-board,Kapton,RAPHAEL | 1 |
| 35 | 76H02981-00M | Poron,Navipcb-bottom-sponge--IPX1,Raphael | 2 |
| 36 | 76H02982-00M | Poron,Navipcb-sponge-lcm-connector-IPX1,Raphael | 1 |
| 37 | 76H02983-00M | Poron,Navipcb-sponge-main-fpc-connector-IPX1,Raphael | 1 |
| 38 | 76H02984-00M | ME Gasket,Gasket-battery-room,Raphael | 1 |
| 39 | 76H03122-00M | ME Gasket,gasket for GPS grounding,Raphael | 1 |
| 40 | 77H00668-00M | Water Sensitive Label,MING JYE,4*2.5mm,3M 5558,Diamond | 1 |
| 41 | 71H02305-00M | Button,Volume-key,Raphael | 1 |
| 42 | 71H02307-00M | Button,Power-key,Raphael | 1 |
| 43 | 74H01128-00M | Cover Pre-Assy,Sound cover Pre-Assy,Raphael | 1 |
| 44 | 74H01130-00M | Cover Pre-Assy,B,Raphael | 1 |
| 45 | 74H01142-00M | Cover Pre-Assy,Battery ,Raphael | 1 |
| 46 | 74H01143-00M | Cover Pre-Assy,D part,Raphael | 1 |
| 47 | 74H01151-00M | Cover Pre-Assy,B,UPPER,Raphael | 1 |
| 48 | 74H01152-00M | Stylus Pre-Assy,Raphael | 1 |
| 49 | 74H01154-00M | Keycap Pre-Assy,Navi,Raphael | 1 |
| 50 | 80H00736-XX | FRU-SUB ASSY,Rigid-Flex Board ASSY,Navi board W/ metal support,Raphael | 1 |
| 51 | 80H00735-XX | FRU-SUB ASSY,LCM,HTC,Wintek,YOUNG FAST_TW,HITACHI W/Bezel,Raphael | 1 |
| 52 | 80H00740-XX | FRU-SUB ASSY,Keypad Pre-Assy W/ FPC and C part,Raphael | 1 |
| 53 | 80H00756-XX | FRU-SUB ASSY,FPC W/ 2nd Camera,Raphael | 1 |

# Picture for SPL 80H Kernel and Accessories

**(Part no on picture is for Generic version only, please check SPL for detail per customer)**

| | |
|---|---|
| **Part No.** | 72H02689-00M |
| **Description** | Screw |
| **Q'ty** | 4 |
| **Repair Code** | N/A |
| **Refurbishment** | No |
| **Return to HTC** | No |



| | |
|---|---|
| **Part No.** | 72H02474-00M |
| **Description** | Screw |
| **Q'ty** | 4 |
| **Repair Code** | N/A |
| **Refurbishment** | No |
| **Return to HTC** | No |



| | |
|---|---|
| **Part No.** | 72H01893-00M |
| **Description** | Screw |
| **Q'ty** | 2 |
| **Repair Code** | N/A |
| **Refurbishment** | No |
| **Return to HTC** | No |



| | |
|---|---|
| **Part No.** | 72H02450-00M |
| **Description** | Screw |
| **Q'ty** | 7 |
| **Repair Code** | N/A |
| **Refurbishment** | No |
| **Return to HTC** | No |



| | |
|---|---|
| **Part No.** | 72H02886-00M |
| **Description** | Screw, Main PCB |
| **Q'ty** | 1 |
| **Repair Code** | N/A |
| **Refurbishment** | No |
| **Return to HTC** | No |



| | |
|---|---|
| **Part No.** | 72H02865-00M |
| **Description** | Screw, Hinge |
| **Q'ty** | 6 |
| **Repair Code** | N/A |
| **Refurbishment** | No |
| **Return to HTC** | No |



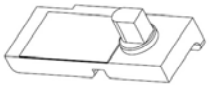
| | |
|---|---|
| **Part No.** | 72H02749-00M |
| **Description** | Conductive Fabric, LCD FPC |
| **Q'ty** | 1 |
| **Repair Code** | N/A |
| **Refurbishment** | No |
| **Return to HTC** | No |



| | |
|---|---|
| **Part No.** | 77H00623-00M |
| **Description** | Regulation Label |
| **Q'ty** | 1 |
| **Repair Code** | N/A |
| **Refurbishment** | No |
| **Return to HTC** | No |



| Part No. | 74H01285-00M |
|---|---|
| Description | Light-sensor-lens-assy |
| Q'ty | 1 |
| Repair Code | G118 |
| Refurbishment | Yes |
| Return to HTC | No |



| Part No. | 72H02819-00M |
|---|---|
| Description | EMI Gasket, Gasket between MB and C parts |
| Q'ty | 1 |
| Repair Code | N/A |
| Refurbishment | No |
| Return to HTC | No |



| Part No. | 76H02981-00M |
|---|---|
| Description | Poron, Navipcb-bottom-sponge |
| Q'ty | 2 |
| Repair Code | N/A |
| Refurbishment | No |
| Return to HTC | No |



| Part No. | 72H02756-00M |
|---|---|
| Description | EMI Gasket, Navi-board |
| Q'ty | 1 |
| Repair Code | N/A |
| Refurbishment | No |
| Return to HTC | No |



| Part No. | 76H02982-00M |
|---|---|
| Description | Poron, Navipcb-sponge-lcm-connector |
| Q'ty | 1 |
| Repair Code | N/A |
| Refurbishment | No |
| Return to HTC | No |



| Part No. | 76H02983-00M |
|---|---|
| Description | Poron, Navipcb-sponge-main-fpc-connector |
| Q'ty | 1 |
| Repair Code | N/A |
| Refurbishment | No |
| Return to HTC | No |



| Part No. | 72H02843-00M |
|---|---|
| Description | EMI Gasket, MPCB for Main Camera |
| Q'ty | 1 |
| Repair Code | N/A |
| Refurbishment | No |
| Return to HTC | No |



| Part No. | 72H02844-00M |
|---|---|
| Description | EMI Gasket, Main Camera |
| Q'ty | 1 |
| Repair Code | N/A |
| Refurbishment | No |
| Return to HTC | No |



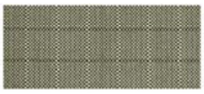
| Part No. | 72H02854-00M |
|---|---|
| Description | Conductive Fabric, Main-FPC_upper |
| Q'ty | 1 |
| Repair Code | N/A |
| Refurbishment | No |
| Return to HTC | No |



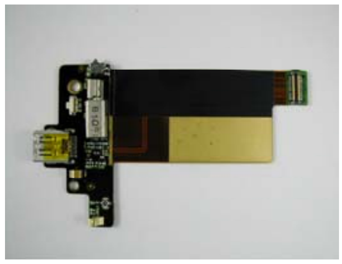
| Part No. | 76H02770-00M |
|---|---|
| Description | Mylar, IO-BD_connector |
| Q'ty | 1 |
| Repair Code | N/A |
| Refurbishment | No |
| Return to HTC | No |



| Part No. | 72H02703-00M |
|---|---|
| Description | Conductive Fabric, Co-axial cable |
| Q'ty | 1 |
| Repair Code | N/A |
| Refurbishment | No |
| Return to HTC | No |



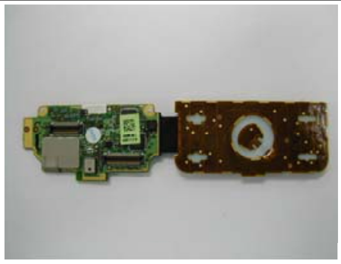
| Part No. | 51H10078-02M |
|---|---|
| Description | IO-Board |
| Q'ty | 1 |
| Repair Code | M201.2 |
| Refurbishment | No |
| Return to HTC | No |



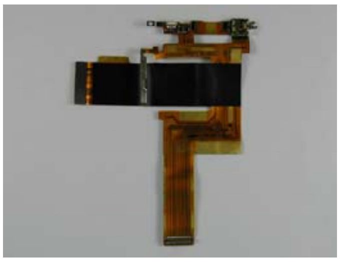
| Part No. | 51H40450-01M |
|---|---|
| Description | Main Board |
| Q'ty | 1 |
| Repair Code | M101 |
| Refurbishment | No |
| Return to HTC | Yes |



| Part No. | 80H00736-00 |
|---|---|
| Description | NAVI key assy |
| Q'ty | 1 |
| Repair Code | M201.1 |
| Refurbishment | No |
| Return to HTC | No |



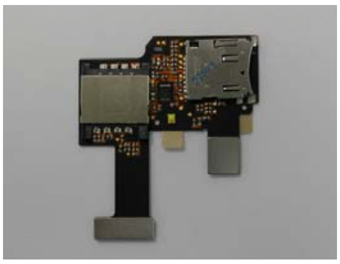
| Part No. | 73H20177-41M |
|---|---|
| Description | Sliding BD with 2nd camera, w/o PTT |
| Q'ty | 1 |
| Repair Code | C122.3 |
| Refurbishment | No |
| Return to HTC | No |



| Part No. | 74H01154-00M |
|---|---|
| Description | Navi Keycap |
| Q'ty | 1 |
| Repair Code | C109 |
| Refurbishment | Yes |
| Return to HTC | No |



| Part No. | 73H20145-09M |
|---|---|
| Description | SIM FPC |
| Q'ty | 1 |
| Repair Code | C122 |
| Refurbishment | No |
| Return to HTC | No |



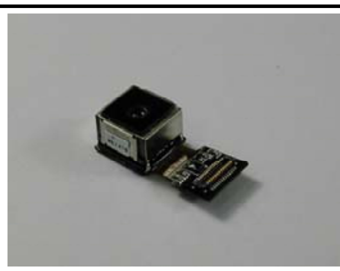
| Part No. | 80H00735-01 |
|---|---|
| Description | LCM with A-cover |
| Q'ty | 1 |
| Repair Code | L101.2 |
| Refurbishment | Yes |
| Return to HTC | Yes |



| Part No. | 77H00711-00M |
|---|---|
| Description | Tamper evident label |
| Q'ty | 1 |
| Repair Code | N/A |
| Refurbishment | No |
| Return to HTC | No |



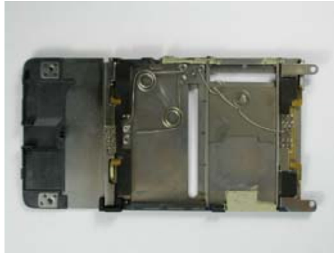

| Part No. | 54H00279-00M |
|---|---|
| Description | Main Camera |
| Q'ty | 1 |
| Repair Code | G117 |
| Refurbishment | Yes |
| Return to HTC | No |



| | |
|---|---|
| Part No. | 74H01152-00M |
| Description | Stylus |
| Q'ty | 1 |
| Repair Code | G102 |
| Refurbishment | No |
| Return to HTC | No |



| | |
|---|---|
| Part No. | 74H01130-00M |
| Description | B Cover |
| Q'ty | 1 |
| Repair Code | C102.8 |
| Refurbishment | Yes |
| Return to HTC | No |



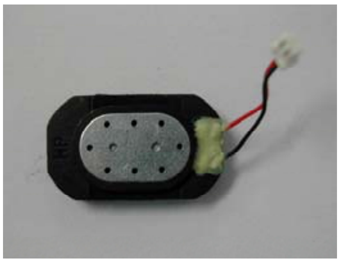
| | |
|---|---|
| Part No. | 35H00111-08M |
| Description | Battery |
| Q'ty | 1 |
| Repair Code | B101 |
| Refurbishment | No |
| Return to HTC | Yes |



| | |
|---|---|
| Part No. | 36H00694-00M |
| Description | Receiver |
| Q'ty | 1 |
| Repair Code | G103.1 |
| Refurbishment | No |
| Return to HTC | No |



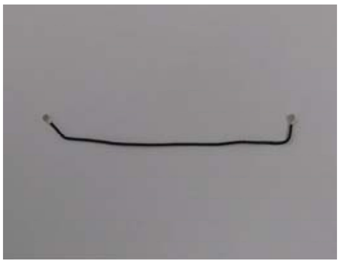
| | |
|---|---|
| Part No. | 36H00717-00M |
| Description | Speaker |
| Q'ty | 1 |
| Repair Code | G103 |
| Refurbishment | No |
| Return to HTC | No |



| | |
|---|---|
| Part No. | 72H02815-00M |
| Description | EMI Gasket, Gasket for Hinge |
| Q'ty | 1 |
| Repair Code | N/A |
| Refurbishment | No |
| Return to HTC | No |



| | |
|---|---|
| Part No. | 73H00282-00M |
| Description | Coaxial Cable |
| Q'ty | 1 |
| Repair Code | B108 |
| Refurbishment | No |
| Return to HTC | No |



| | |
|---|---|
| Part No. | 76H02314-00M |
| Description | Mic Rubber |
| Q'ty | 1 |
| Repair Code | N/A |
| Refurbishment | No |
| Return to HTC | No |



| | |
|---|---|
| Part No. | 71H02564-00M |
| Description | Damper, left-upper |
| Q'ty | 1 |
| Repair Code | C113 |
| Refurbishment | No |
| Return to HTC | No |



| | |
|---|---|
| Part No. | 72H02863-00M |
| Description | Damper, left-down |
| Q'ty | 1 |
| Repair Code | C113 |
| Refurbishment | No |
| Return to HTC | No |



| | |
|---|---|
| **Part No.** | 71H02305-00M |
| **Description** | Volume Key |
| **Q'ty** | 1 |
| **Repair Code** | C106 |
| **Refurbishment** | Yes |
| **Return to HTC** | No |



| | |
|---|---|
| **Part No.** | 71H02307-00M |
| **Description** | Power Key |
| **Q'ty** | 1 |
| **Repair Code** | C106 |
| **Refurbishment** | Yes |
| **Return to HTC** | No |



| | |
|---|---|
| **Part No.** | 74H01128-00M |
| **Description** | Sound Cover |
| **Q'ty** | 1 |
| **Repair Code** | N/A |
| **Refurbishment** | No |
| **Return to HTC** | No |



| | |
|---|---|
| **Part No.** | 74H01142-00M |
| **Description** | Battery Cover |
| **Q'ty** | 1 |
| **Repair Code** | C112 |
| **Refurbishment** | Yes |
| **Return to HTC** | No |



| | |
|---|---|
| **Part No.** | 74H01143-00M |
| **Description** | D Part |
| **Q'ty** | 1 |
| **Repair Code** | C102.6 |
| **Refurbishment** | Yes |
| **Return to HTC** | No |



| | |
|---|---|
| **Part No.** | 74H01151-00M |
| **Description** | B Upper Cover |
| **Q'ty** | 1 |
| **Repair Code** | C102.7 |
| **Refurbishment** | Yes |
| **Return to HTC** | No |



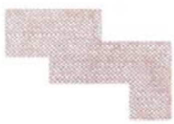
| | |
|---|---|
| **Part No.** | 80H00740-00 |
| **Description** | QWERTY keyboard assy |
| **Q'ty** | 1 |
| **Repair Code** | C122.1 |
| **Refurbishment** | Yes |
| **Return to HTC** | No |



| | |
|---|---|
| **Part No.** | 77H00668-00M |
| **Description** | Water sensitive label |
| **Q'ty** | 1 |
| **Repair Code** | N/A |
| **Refurbishment** | No |
| **Return to HTC** | No |



| | |
|---|---|
| **Part No.** | 72H02845-00M |
| **Description** | EMI Gasket, MicroSD Connector |
| **Q'ty** | 1 |
| **Repair Code** | N/A |
| **Refurbishment** | No |
| **Return to HTC** | No |



| | |
|---|---|
| **Part No.** | 76H02984-00M |
| **Description** | ME Gasket, Gasket-battery-room |
| **Q'ty** | 1 |
| **Repair Code** | N/A |
| **Refurbishment** | No |
| **Return to HTC** | No |



| | | |
|---|---|---|
| **Part No.** | 76H03122-00M |  |
| **Description** | ME Gasket, gasket for GPS grounding | |
| **Q'ty** | 1 | |
| **Repair Code** | N/A | |
| **Refurbishment** | No | |
| **Return to HTC** | No | |

| | | |
|---|---|---|
| **Part No.** | 76H02823-00M |  |
| **Description** | Tape, For LCD gasket. on navi-board | |
| **Q'ty** | 1 | |
| **Repair Code** | N/A | |
| **Refurbishment** | No | |
| **Return to HTC** | No | |

| | | |
|---|---|---|
| **Part No.** | 72H02816-00M |  |
| **Description** | EMI Gasket, Gasket for Hinge (Navi board) | |
| **Q'ty** | 1 | |
| **Repair Code** | N/A | |
| **Refurbishment** | No | |
| **Return to HTC** | No | |

| | | |
|---|---|---|
| **Part No.** | 72H02855-00M |  |
| **Description** | Conductive Fabric, Main-FPC-lower | |
| **Q'ty** | 1 | |
| **Repair Code** | N/A | |
| **Refurbishment** | No | |
| **Return to HTC** | No | |

| | | |
|---|---|---|
| **Part No.** | 76H02625-00M |  |
| **Description** | Mylar, Main PCB | |
| **Q'ty** | 1 | |
| **Repair Code** | N/A | |
| **Refurbishment** | No | |
| **Return to HTC** | No | |

| | | |
|---|---|---|
| **Part No.** | | |
| **Description** | | |
| **Q'ty** | | |
| **Repair Code** | | |
| **Refurbishment** | | |
| **Return to HTC** | | |

**NOTE:**

**THE PHOTO OF SPL IS GENERIC AND FOR REFERENCE ONLY, THE COLOR AND THE APPEARANCE MAY BE DIFFERENT FROM THE SHIPPED PARTS, IF YOU WANT TO APPLY THOSE PARTS, PLEASE CONTACT YOUR SERVICE ACCOUNT MANAGER FOR MORE INFORMATION.**

**AS FOR PICTURE, PLEASE REFER TO THE TABLE AS BELOW.**

## 9.2 Board Level 2.5 Repairs

■ Basic Repair Instructions for Component Replacement:

Step 1 Place the solder-proof tape to cover the surrounding area of the components which being replaced.

Warning：DO NOT overheat the tape and components to avoid the tape melted and the components damaged

Step 2 Use Heater Gun (HAKO850B, set the temperature between 350°C, Air Speed 3~5) to remove the components.

Step 3 Wait till the temperature cool down before removing the solder-proof tape to avoid other components being removed

Step 4 After the damaged or defective components have been replaced; clear the surroundings for solder and flux residues.

Notice:

A. Check the polarity and the position of the components, it can't be shifted, reversed or lifted.

B. All the parts of the PCB should be checked if it is missing or not.

C. The OP must to wear antistatic wrist strap .Don't put boards together and avoid hitting them.

D. When you solder and repair that the soldering iron temperature must be setup 415℃. (The temperature range is 415℃±5℃),and the solder wire's diameter is 0.4/0.5/0.6mm(SAC 305 (1.1%)

E. Please be noticed to follow below steps for main board repair which is equipped with **Golden Capacitor**:

1. When replacing level 2.5 components located around the golden capacitor:
   - I. The temperature of the hot air blower must be under 400°c
   - II. When apply the hot air to the part / component, the heating time must be under 20 seconds (including the time of removing and soldering)
   - III. The temperature of the soldering iron must be under 350°c
   - IV. When apply the solder tip to the part / component, the heating time must be under 5 seconds
   - V. The solder tip must not contact with the golden capacitor
2. For BGA replacement: The golden capacitor must be removed before perform pre-heating, heating, soldering and de-soldering process, and then it must be replaced with a new one (please refer to 1.c. and 1.d. steps)
3. For main board which failed to pass the function test, the golden capacitor must be replaced with a new one and must follow below soldering criteria: The temperature of the soldering iron must be under 350°c When apply the solder tip to the part / component, the heating time must be under 5 seconds The solder tip must not have a contact with the body of golden capacitor

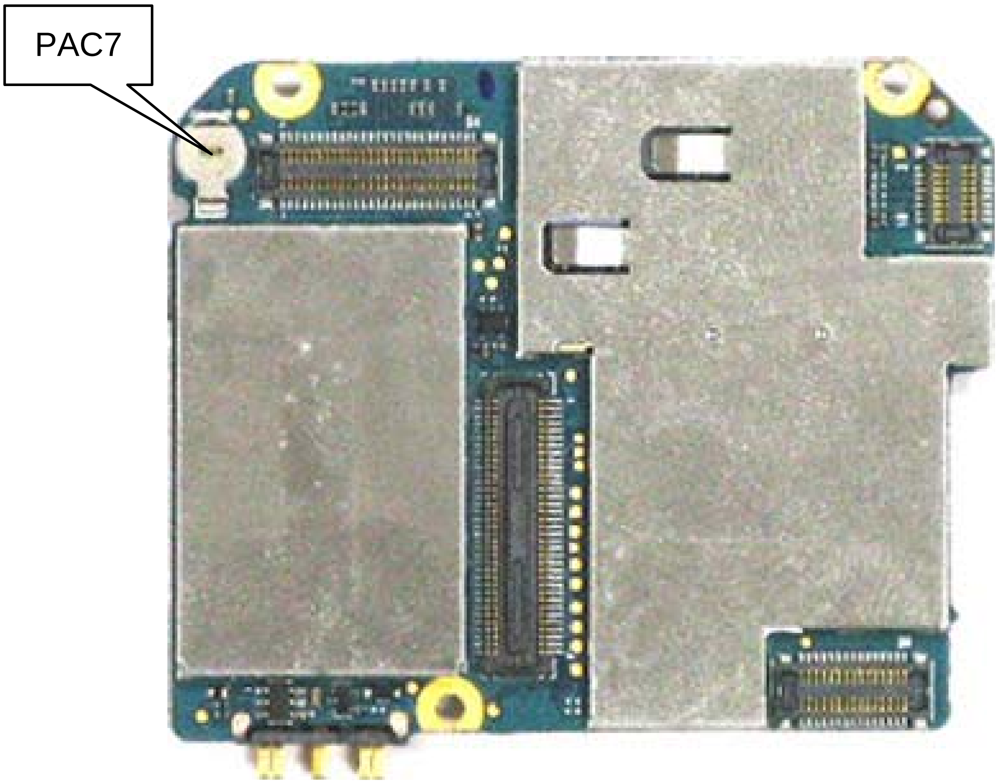
- **MAIN BOARD (51H40450-XXM)**

**TOP SIDE**



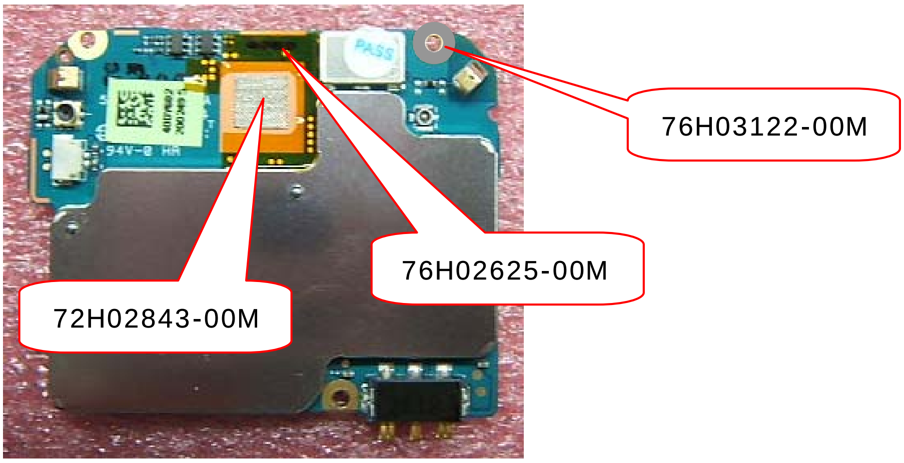

| P/N | Description | Location | Remark |
|---|---|---|---|
| 75H00776-00M | Connector Device,60mohm,SUYIN,060062MB003GX01ZL, 3P,2.75Pitch,2A,12V | PACON1 | Battery connector |

**BOTTOM SIDE**




| P/N | Description | Location | Remark |
|---|---|---|---|
| 16H00019-00M | Gold Cap,0.02F,300ohm,SEIKO,XH311HGII45E, 60/-20degC,+/-30%,3.3V,5.8*3.8*1.45mm | PAC7 | Gold Cap |

## 9.3 FRU M/B additional parts location







| P/N | Description |
|---|---|
| 76H02625-00M | Mylar,Main PCB |
| 72H02843-00M | EMI Gasket,MPCB for Main Camera |
| 76H03122-00M | ME Gasket,gasket for GPS grounding |
| 76H02377-00M | Tape |

# 10. RF Antenna Specification

| Raphael WCDMA Antenna Test Specification | | | | | |
|---|---|---|---|---|---|
| Item | Test Name | TX Level | Uplink / Downlink UA RF CN | 1st Downlink cell power | note |
| 1 | Camp@ W-CDMA Band ( 2100 ) | 3 | 9612 / 10562 | -60 | |
| 2 | BS Originate Cell | 3 | 9612 / 10562 | -60 | |
| Receiver Test | | | | | |
| 3 | Fast Bit Error Rate | 3 | 9612 / 10562 | -104 | <= 0.1 % |
| 4 | Fast Bit Error Rate | 3 | 9750 / 10700 | -104 | |
| 5 | Fast Bit Error Rate | 3 | 9888 / 10838 | -104 | |
| Transmitter Test | | | | | |
| 6 | TX Power | 3 | 9612 / 10562 | -60 | >= 18 dbm |
| 7 | TX Power | 3 | 9750 / 10700 | -60 | |
| 8 | TX Power | 3 | 9888 / 10838 | -60 | |
| Raphael WCDMA Antenna Test Specification | | | | | |
| Item | Test Name | TX Level | Uplink / Downlink UA RF CN | 1st Downlink cell power | note |
| 1 | Camp@ W-CDMA Band ( 1900 ) | 3 | 9262 / 9662 | -60 | |
| 2 | BS Originate Cell | 3 | 9262 / 9662 | -60 | |
| Receiver Test | | | | | |
| 3 | Fast Bit Error Rate | 3 | 9262 / 9662 | -104 | <= 0.1 % |
| 4 | Fast Bit Error Rate | 3 | 9400 / 9800 | -104 | |
| 5 | Fast Bit Error Rate | 3 | 9538 / 9938 | -104 | |
| Transmitter Test | | | | | |
| 6 | TX Power | 3 | 9262 / 9662 | -60 | >= 18 dbm |
| 7 | TX Power | 3 | 9400 / 9800 | -60 | |
| 8 | TX Power | 3 | 9538 / 9938 | -60 | |
| Raphael WCDMA Antenna Test Specification | | | | | |

| Item | Test Name | TX Level | Uplink / Downlink UA RF CN | 1st Downlink cell power | note |
|---|---|---|---|---|---|
| 1 | Camp@ W-CDMA Band ( 1700 ) | 3 | 8762 / 9237 | -60 | |
| 2 | BS Originate Cell | 3 | 8762 / 9237 | -60 | |
| | Receiver Test | | | | |
| 3 | Fast Bit Error Rate | 3 | 8762 / 9237 | -104 | |
| 4 | Fast Bit Error Rate | 3 | 8787 / 9262 | -104 | <= 0.1 % |
| 5 | Fast Bit Error Rate | 3 | 8812 / 9287 | -104 | |
| | Transmitter Test | | | | |
| 6 | TX Power | 3 | 8762 / 9237 | -60 | |
| 7 | TX Power | 3 | 8787 / 9262 | -60 | >= 18 dbm |
| 8 | TX Power | 3 | 8812 / 9287 | -60 | |

Raphael WCDMA Antenna Test Specification

| Item | Test Name | TX Level | Uplink / Downlink UA RF CN | 1st Downlink cell power | note |
|---|---|---|---|---|---|
| 1 | Camp@ W-CDMA Band ( 900 ) | 3 | 2712 / 2937 | -60 | |
| 2 | BS Originate Cell | 3 | 2712 / 2937 | -60 | |
| | Receiver Test | | | | |
| 3 | Fast Bit Error Rate | 3 | 2712 / 2937 | -104 | |
| 4 | Fast Bit Error Rate | 3 | 2788 / 3013 | -104 | <= 0.1 % |
| 5 | Fast Bit Error Rate | 3 | 2863 / 3088 | -104 | |
| | Transmitter Test | | | | |
| 6 | TX Power | 3 | 2712 / 2937 | -60 | |
| 7 | TX Power | 3 | 2788 / 3013 | -60 | >= 18 dbm |
| 8 | TX Power | 3 | 2863 / 3088 | -60 | |

Raphael WCDMA Antenna Test Specification

| Item | Test Name | TX Level | Uplink / Downlink UA RF CN | 1st Downlink cell power | note |
|---|---|---|---|---|---|
| 1 | Camp@ W-CDMA Band ( 850 ) | 3 | 4132 / 4357 | -60 | |

| | | | | | |
|---|---|---|---|---|---|
| 2 | BS Originate Cell | 3 | 4132 / 4357 | -60 | |
| Receiver Test | | | | | |
| 3 | Fast Bit Error Rate | 3 | 4132 / 4357 | -104 | |
| 4 | Fast Bit Error Rate | 3 | 4175 / 4400 | -104 | <= 0.1 % |
| 5 | Fast Bit Error Rate | 3 | 4233 / 4458 | -104 | |
| Transmitter Test | | | | | |
| 6 | TX Power | 3 | 4132 / 4357 | -60 | |
| 7 | TX Power | 3 | 4175 / 4400 | -60 | >= 18 dbm |
| 8 | TX Power | 3 | 4233 / 4458 | -60 | |

| Raphael WCDMA Antenna Test Specification | | | | | |
|---|---|---|---|---|---|
| Item | Test Name | TX Level | Uplink / Downlink UA RF CN | 1st Downlink cell power | note |
| 1 | Camp@ W-CDMA Band ( AWS ) | 3 | 1312 / 1537 | -60 | |
| 2 | BS Originate Cell | 3 | 1312 / 1537 | -60 | |
| Receiver Test | | | | | |
| 3 | Fast Bit Error Rate | 3 | 1312 / 1537 | -104 | |
| 4 | Fast Bit Error Rate | 3 | 1450 / 1675 | -104 | <= 0.1 % |
| 5 | Fast Bit Error Rate | 3 | 1513 / 1738 | -104 | |
| Transmitter Test | | | | | |
| 6 | TX Power | 3 | 1312 / 1537 | -60 | |
| 7 | TX Power | 3 | 1450 / 1675 | -60 | >= 18 dbm |
| 8 | TX Power | 3 | 1513 / 1738 | -60 | |

| Raphael GSM Antenna Test Specification | | | | | |
|---|---|---|---|---|---|
| Item | Test Name | TX Level | TCH | 1st Downlink cell power | note |
| 1 | Wait_Signal | 0 | 600 | -65 | |
| 2 | Power_Class | 0 | 600 | -65 | |
| PCS 1900 Receiver Test | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 3 | Fast Bit Error Rate | 0 | 512 | -104 | |
| 4 | Fast Bit Error Rate | 0 | 661 | -104 | <= 2 % |
| 5 | Fast Bit Error Rate | 0 | 810 | -104 | |
| PCS 1900 Transmitter Test | | | | | |
| 6 | TX Power | 0 | 512 | -65 | |
| 7 | TX Power | 0 | 661 | -65 | >= 26 dbm |
| 8 | TX Power | 0 | 810 | -65 | |
| GSM 850 Receiver Test (For US SKU) | | | | | |
| 9 | Fast Bit Error Rate | 5 | 128 | -104 | |
| 10 | Fast Bit Error Rate | 5 | 190 | -104 | <= 2 % |
| 11 | Fast Bit Error Rate | 5 | 251 | -104 | |
| GSM 850 Transmitter Test (For US SKU) | | | | | |
| 12 | TX Power | 5 | 128 | -65 | |
| 13 | TX Power | 5 | 190 | -65 | >= 28 dbm |
| 14 | TX Power | 5 | 251 | -65 | |
| EGSM 900 Receiver Test (For EU SKU) | | | | | |
| 9 | Fast Bit Error Rate | 5 | 975 | -104 | |
| 10 | Fast Bit Error Rate | 5 | 38 | -104 | <= 2 % |
| 11 | Fast Bit Error Rate | 5 | 124 | -104 | |
| EGSM 900 Transmitter Test (For EU SKU) | | | | | |
| 12 | TX Power | 5 | 975 | -65 | |
| 13 | TX Power | 5 | 38 | -65 | >= 28 dbm |
| 14 | TX Power | 5 | 124 | -65 | |
| DCS 1800 Receiver Test | | | | | |
| 21 | Fast Bit Error Rate | 0 | 512 | -104 | |
| 22 | Fast Bit Error Rate | 0 | 699 | -104 | <= 2 % |
| 23 | Fast Bit Error Rate | 0 | 885 | -104 | |
| DCS 1800 Transmitter Test | | | | | |
| 24 | TX Power | 0 | 512 | -65 | |
| 25 | TX Power | 0 | 699 | -65 | >= 26 dbm |
| 26 | TX Power | 0 | 885 | -65 | |